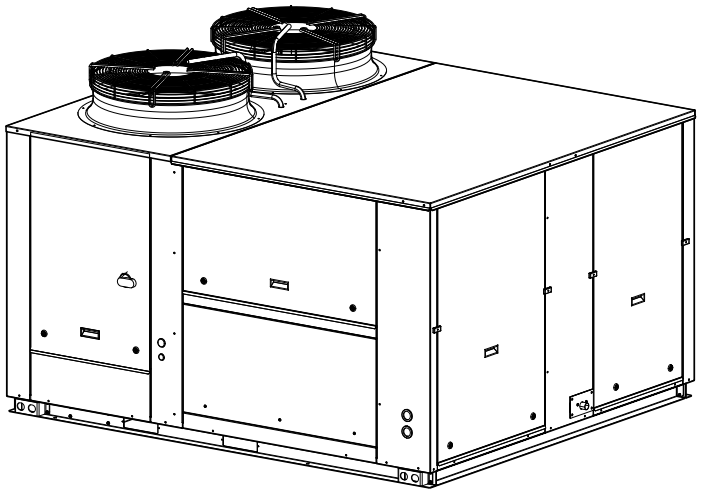
YORK
BY JOHNSON CONTROLS

ACTIVA SERIES ROOF TOP Air Conditioners 017/040



Installation manual

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AENOR ISO 14001 Gestión Ambiental CGM-97/013

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1

Installation manual

1.1 Safety instructions

This document contains the necessary information for the safe and efficient transportation, assembly and installation of the air conditioning unit. This guarantees the condition of the unit and its operating safety.

Only an authorised company may assemble the air conditioning unit.

ATTENTION

Only authorised companies with the appropriate technical resources and suitably trained personnel may install the air conditioning unit.

CAUTION

The specialists responsible for installing the air conditioning unit must make sure they have all of the information and knowledge required to correctly install, test and deliver the unit. Johnson Controls Inc. shall not be considered responsible for any damage caused by installation of the unit that is no consistent with that described in this document or others specifically provided with the unit.

During regular equipment installation, the fitter must pay special attention to certain situations in order to prevent injuries or damage to the unit.

Situations that could jeopardise the safety of the fitter or that of others nearby or that could put the unit itself at risk are clearly indicated in this manual.

A series of special symbols are used to clearly identify these situations.

Pay careful attention to these symbols and to the messages following them, as your safety and the safety of others depends on it.

1.2 Icons used in this document

DANGER

- *The text following this symbol contains information and instructions relating directly to your safety and physical wellbeing.*
- *Not taking these instructions into account could lead to serious, very serious or even fatal injuries to you and others in the proximities of the unit.*

Information can also be found on safe procedures during unit handling. This will help reduce the risk of accidents.

CAUTION

- *The text following this symbol contains information and instructions relating directly to your safety and physical wellbeing.*
- *Not taking these instructions into account could lead to minor injuries to you and others in the proximities of the unit.*
- *Not taking these instructions into account could lead to unit damage.*

Information can also be found on safe procedures during unit handling. This will help reduce the risk of accidents.

NOTE

- *The text following this symbol contains information or instructions that may be of use or that is worthy of a more thorough explanation.*
- *Instructions regarding inspections to be made on unit parts or systems may also be included.*

1.3 Instructions for storage, transport and handling of the unit

Delivery inspection

The unit should be carefully inspected for visible damage or abnormalities as soon as it is received.

Any abnormalities or damage to the unit should be communicated to both the transportation and insurance company in writing.

Storage instructions

The unit should be stored in a place suitable to the purpose (warehouse or similar), protected from the weather, water, humidity and dust.

Cover the unit with a canvas of a suitable size.

The unit should be appropriately protected from knocks and dust, ensuring the protective parts it was supplied with remain in place. Where these are not in place, establish the necessary protections and/or barriers to keep vehicles or fork-lift trucks away.

Transport and handling of the unit

The units should only be handled by personnel from the company responsible for their installation.

Transport of the unit should be in such a manner that no damage is caused by faulty or inadequate mooring to the bed or body of the vehicle.

Where necessary, protect all of the edges of the unit against knocks and scratches and moor it to the bed or body of the vehicle using suitable textile belts or slings to keep it perfectly still.

Loading and unloading the unit from a truck or trailer should be on flat, solid ground using an appropriate crane or fork-lift truck with sufficient capacity.

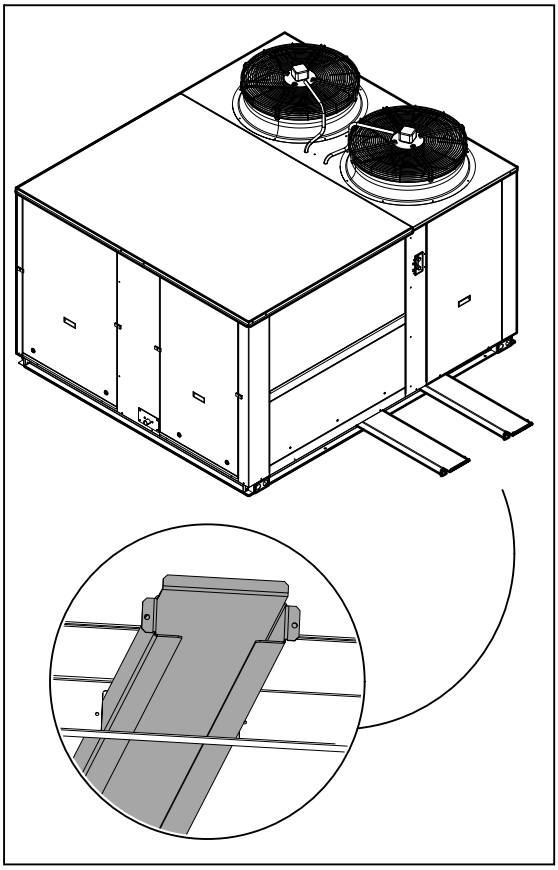
1.3.1 Disposal of packaging

The packaging is recyclable. Dispose of it in the appropriate place or take it to an appropriate collection centre. Respect the regulations in force for this type of waste in the country where the unit is being installed.

Packaging remains must be correctly disposed of. Improper disposal of packaging generates environmental problems that affect human life.

1.3.2 Protections for the base

Before hoisting and the installation of the unit, remove the protections for the base designed for handling with a fork-lift truck.

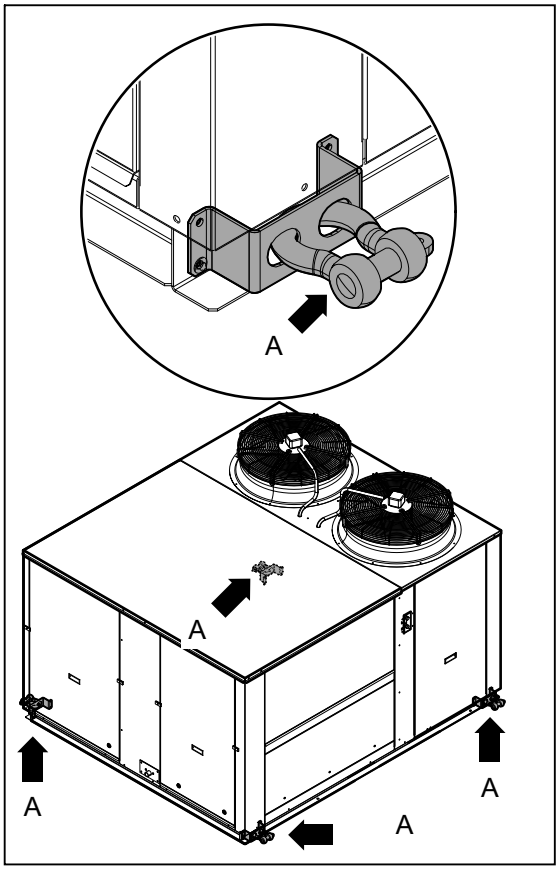


1.3.3 Hoisting points

The points designed for hoisting the unit are located on the beams on its base **-arrows-**.

Install 1/2" shackles **-A-** on the points designed for hoisting.

Before hoisting the unit, check that the cables or slings are firmly hooked to these points and make sure the crane and the cables or slings are capable of lifting the weight.



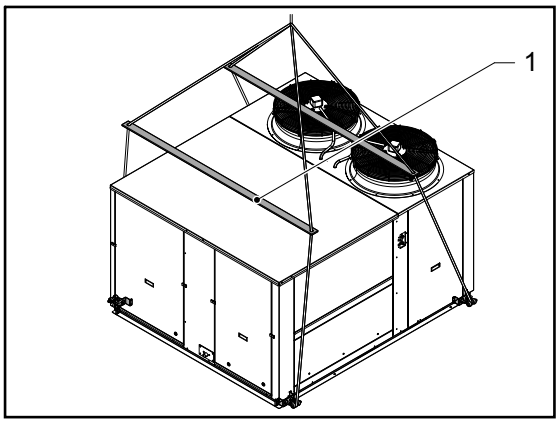
Place spacers **-1-** at the top of the unit to prevent the cables or slings from touching it.

Attach guide ropes so that the unit does not rotate freely.

The cables or slings should be long enough to form an angle of over 45° to the horizontal plane. Hoist the unit keeping it in a horizontal position.

DANGER

There should not be onlookers within a radius of 10 m of the unit when it is being hoisted.

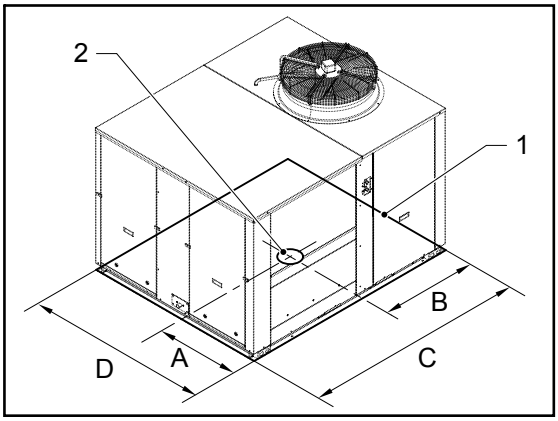


Centre of gravity of the unit (basic unit, without options or accessories)

Models	017	022	032	040
A	810	800	940	940
B	830	820	900	900
C	1866	1866	2135	2135
D	1540	1540	1850	1850

All measurements in mm.

1. End of the outdoor coil
2. Centre of gravity



1.4 Technical data

1.4.1 Technical and physical data for ARC (only cooling) and ARG (only cooling + gas heating)

Models		ARC/ARG	017	022	032	040
Cooling capacity (1)	Net cooling capacity	kW	18,2	22,2	31	39,9
	Rated absorbed power	kW	5,8	7,4	9,9	14,2
	Net EER		3,25	3,15	3,23	2,9
Heating (ARC)	Optional heating element heating capacity (400 V) (2)	kW	16 - 25		16 -25 - 37	
Gas Heating (ARG)	Heat capacity at 100% power	(LHV) Total kW	25,6		45,6	
		Net (2) kW	23		41	
	Gas consumption at 100% (2ND-H natural gas, G20 at 20 mbar and 15 °C)	m^3/h	2,5		4,5	
	Stages	No.	2			
Compressors	Rated/start-up current	A	8,5 / 75	11,4 / 95	2 x 7,2 / 64	2 x 11 / 101
	Type and quantity		Scroll/1		Scroll/2 (Tandem)	
	Degree of protection		IP21			
Coolant (R-410A)		kg	9,7	10	13,8	14
Power supply		V/ph/Hz	400 / 3 + N / 50			
Indoor fan (3)	Rated air flow	m^3/h	3400	4300	5700	7400
	Rated static pressure / maximum with rated flow	Pa	75 / 600	75 / 600	75 / 600	75 / 600
	Maximum flow rate	m^3/h	4000	5100	6800	8600
	Minimum flow rate	m^3/h	2800	3500	4700	6200
	Motor (IP54) Maximum power	kW	1,85		2,8	
	Maximum current	A	2,9		4,3	
Indoor coil (evaporator)	Number of elements	No.	4			
	Distance between fins	mm	1,81	1,81	1,81	1,81
	Front surface	m^2	0,87	0,87	1,22	1,22
Air filters (G4)	Quantity per unit	No.	4			
	Dimensions	mm	495 x 510 x 48		620 x 510 x 48	
Outdoor fan	Diameter/number	mm	630 / 1		630 / 2	
	Total rated flow	m^3/h	8000		15000	
	Motor (IP54)	kW	0,6		0,6 (x 2)	
	Rated current	A	2,6		2,6 (x 2)	
Outdoor coil (condenser)	Number of elements	No.	3		4	
	Distance between fins	mm	1,81	1,81	1,81	1,81
	Front area	m^2	1,49	1,49	1,82	1,82
Net dimensions (4)	Height	mm	1420		1420	
	Length	mm	1866		2135	
	Width	mm	1540		1850	
Net weight (basic unit without accessories) (4)	ARC	kg	420	440	581	585
	ARG	kg	462	482	642	646
Electrical features of the unit	Total rated power	kW	7	9	14	17
	Total rated current	A	14	18	26	33
	Total maximum power	kW	9	11	16	20
	Total maximum current	A	16	21	30	38
	Circuit breaker (K Curve) (5)	A	20	25	40	50
	Minimum cable section (6)	mm^2	4	6	10	16

(1) Data in compliance with Eurovent conditions, summer: indoor 27 °C TS/19 °C TH - outdoor TS 35 °C. Winter: Indoor TS 20 °C, outdoor TS 7 °C / TH 6 °C (TS Dry-bulb thermometer; TH Wet-bulb thermometer), with vertical ducts, rated air flow and pressure.

Net EER = Net cooling capacity / Total absorbed power (according to Eurovent).

(2) Add the inside motor consumption to find the total calorific capacity.

(3) See *Indoor fan, see on page 30.*

(4) Consider the additional weight of options and accessories. To do so, see *Weight options and accessories, see on page 9.*

LHV: Lower heating value.

(5) and (6) Circuit breaker with K curve, according to DIN, VDE 0660-104. Section of cables for the power supply line based on copper conductors, 105 °C. The circuit breaker and the section of power supply cables indicated are for guidance. They should be adjusted based on the requirements of each installation, distance between units, fall in planned voltage and on the application of the current regulations with respect to the country where the unit is being installed.

1.4.2 ARH technical and physical data (heat pump) and ARD (heat pump + gas heating)

Models		ARH/ARD	017	022	032	040
Cooling capacity (1)	Net cooling capacity	kW	18,2	22,2	31	39,9
	Rated absorbed power	kW	5,8	7,4	9,9	14,2
	Net EER		3,25	3,15	3,23	2,9
Heat capacity (1)	Net heating capacity	kW	18,1	22,1	30,9	39,0
	Rated absorbed power	kW	5,7	6,9	9,8	13,5
	Net COP		3,29	3,36	3,23	3
	Optional heating element heating capacity (400 V) (ARH) (2)	kW	16 - 25		16 - 25 - 37	
Gas Heating (ARD)	Heat capacity at 100% power	(LHV) Total kW	25,6		45,6	
		Net (2) kW	23		41	
	Gas consumption at 100% (2ND-H natural gas, G20 at 20 mbar and 15 °C)	m^3/h	2,5		4,5	
	Stages	No.	2			
Compressors	Rated/start-up current	A	8,4 / 75	10,8 / 95	2 x 7,3 / 64	2 x 10,4 / 101
	Type and quantity		Scroll/1		Scroll/2 (Tandem)	
	Degree of protection		IP21			
Coolant (R-410A)		kg	9,7	10	14	14,3
Power supply		V/ph/Hz	400 / 3 + N / 50			
Indoor fan (3)	Rated air flow	m^3/h	3400	4300	5700	7400
	Rated static pressure / maximum with rated flow	Pa	75 / 600	75 / 600	75 / 600	75 / 600
	Maximum flow rate	m^3/h	4000	5100	6800	8600
	Minimum flow rate	m^3/h	2800	3500	4700	6200
	Motor (IP55) Maximum power	kW	1,85		2,8	
	Maximum current	A	2,9		4,3	
Indoor coil (evaporator)	Number of elements	No.	4			
	Distance between fins	mm	1,81	1,81	1,81	1,81
	Front surface	m^2	0,87	0,87	1,22	1,22
Air filters (G4)	Quantity per unit	No.	4			
	Dimensions	mm	495 x 510 x 48		620 x 510 x 48	
Outdoor fan	Diameter/number	mm	630 / 1		630 / 2	
	Total rated flow	m^3/h	8000		15000	
	Motor (IP54)	kW	0,6		0,6 (x 2)	
	Rated current	A	2,6		2,6 (x 2)	
Outdoor coil (condenser)	Number of elements	No.	3		4	
	Distance between fins	mm	1,81	1,81	2,11	2,11
	Front area	m^2	1,49	1,49	1,82	1,82
Net dimensions (4)	Height	mm	1420		1420	
	Length	mm	1866		2135	
	Width	mm	1540		1850	
Net weight (basic unit without accessories) (4)	ARH	kg	425	445	587	591
	ARD	kg	467	487	648	652
Electrical features of the unit	Total rated power	kW	7	9	14	17
	Total rated current	A	14	18	26	33
	Total maximum power	kW	9	11	16	20
	Total maximum current	A	16	21	30	38
	Circuit breaker (K Curve) (5)	A	20	25	40	50
	Minimum cable section (6)	mm^2	4	6	10	16

(1) Data in compliance with Eurovent conditions, summer: indoor 27 °C TS/19 °C TH - outdoor TS 35 °C. Winter: Indoor TS 20 °C, outdoor TS 7 °C / TH 6 °C (TS Dry-bulb thermometer; TH Wet-bulb thermometer), with vertical ducts, rated air flow and pressure.

Net EER = Net cooling capacity / Total absorbed power (according to Eurovent).

Net COP = Net heating capacity / Total absorbed power (according to Eurovent).

(2) Add the inside motor consumption to find the total calorific capacity.

(3) See *Indoor fan, see on page 30*

(4) Consider the additional weight of options and accessories. To do so, see *Weight options and accessories, see on page 9.*

LHV: Lower heating value.

(5) and (6) Circuit breaker with K curve, according to DIN, VDE 0660-104. Section of cables for the power supply line based on copper conductors, 105 °C. The circuit breaker and the section of power supply cables indicated are for guidance. They should be adjusted based on the requirements of each installation, distance between units, fall in planned voltage and on the application of the current regulations with respect to the country where the unit is being installed.

1.4.3 Unit sound pressure data

Octave band sound spectrum dB(A), outdoor

Models	017	022	032	040
125 Hz	82,5	82,5	81,3	82,3
250 Hz	78,8	78,8	77	78
500 Hz	75,5	75,5	76,3	77,3
1000 Hz	74,5	74,5	74,7	74,8
2000 Hz	72	72	70,7	71,7
4000 Hz	66,9	66,9	67	68
8,000 Hz	60,3	60,3	61,9	62,9
Sound power level dB (A)	80	80	79,6	80,6
Sound pressure level at 5 m dB (A)	55,3	55,3	54,9	55,9
Sound pressure level at 10 m dB (A)	49,2	49,2	48,8	49,8

Octave band sound spectrum dB(A), indoor

Models	017	022	032	040
125 Hz	72,7	74,8	71,2	73,8
250 Hz	63,7	65,8	66,9	69,5
500 Hz	64,9	67	66,3	68,9
1000 Hz	67,8	69,9	64,9	67,5
2,000 Hz	62,4	64,5	56,7	59,3
4000 Hz	55,4	57,5	52,1	54,7
8,000 Hz	55,3	57,4	51,7	54,3
Sound power level dB (A)	71	73,1	69,6	72,2

1.4.4 Weight options and accessories

Models		017	022	032	040
Economiser	kg	40	40	48	48
Exhaust fan (axial)	kg	60	60	75	75
Roofcurb mounting base (fixed/adjustable)	kg	71 / 95	71 / 95	86 / 114	86 / 114
Heating element	kg	15	15	15	15
Hot water coil	kg	25	25	35	35
Fixed outdoor air intake	kg	8	8	10	10
Barometric damper	kg	11	11	15	15
Copper fin coil	indoor	26	26	34	34
	outdoor	36	36	49	49
Transition Roofcurb	kg	122	122	117	117

1.5 ARC units with auxiliary heating element

ARC Model	Power supply V/Ph/Hz	Heating element			Maximum total current of the unit (A)	Maximum circuit breaker (K Curve) (1)	Minimum cable cross-section (mm^2) (2)
		Power (kW)	Stages (No.)	Current (A)			
017	400/3/50	16	2	24	28	40	10
		25	2	36	40	50	16
022	400/3/50	16	2	24	28	40	10
		25	2	36	40	50	16
032	400/3/50	16	2	24	30	40	10
		25	2	36	42	50	16
		37	2	54	60	80	25
040	400/3/50	16	2	24	30	40	10
		25	2	36	42	50	16
		37	2	54	60	80	25

(1) K Curve (DIN, VDE 0660-104).

(2) Based on copper conductors 105 °C.

1.6 ARH units with auxiliary heating element

ARH Model	Power supply V/Ph/Hz	Heating element			Maximum total current of the unit (A)	Maximum circuit breaker (K Curve) (1)	Minimum cable cross-section (mm^2) (2)
		Power (kW)	Stages (No.)	Current (A)			
017	400/3/50	16	2	24	40	50	16
		25	2	36	52	63	16
022	400/3/50	16	2	24	45	50	16
		25	2	36	57	63	16
032	400/3/50	16	2	24	54	63	16
		25	2	36	66	80	25
		37	2	54	84	100	35
040	400/3/50	16	2	24	62	80	25
		25	2	36	74	100	35
		37	2	54	92	125	50

(1) K Curve (DIN, VDE 0660-104).

(2) Based on copper conductors 105 °C.

1.7 Limits of use

Model					017	022	032	040
Voltage limits				Min./Max V	342/457			
ARC/ARG		Temperature of air inlet in indoor coil		TH °C Min./Max.	15/23	15/23	15/23	15/23
				DB °C Min/Max	20/32	20/32	20/32	20/32
		Outdoor temperature (without condensation control)		TS °C Min.	7	7	7	7
		Maximum outdoor temperature (1)	At full load	TS °C	46	46	46	46
			At partial load	TS °C	–	–	52	52
ARH/ARD	Summer cycle	Temperature of air inlet in indoor coil		WB °C Min./Max.	15/23	15/23	15/23	14/23
				DB °C Min/Max	20/32	20/32	20/32	20/32
		Outdoor temperature (without condensation control)		TS °C Min.	7	7	7	7
		Maximum outdoor temperature (1)	At full load	TS °C	46	46	46	46
			At partial load	TS °C	–	–	52	52
	Winter cycle	Temperature of air inlet in indoor coil		DB °C Min/Max	10/25	10/25	10/25	10/25
		Outdoor temperature		DB °C Min/Max	-10/20	-10/20	-10/20	-10/20
ARG/ARD (2)	Gas heating	Indoor temperature		TS °C Max	30	30	30	30
		Outdoor temperature		DB °C Min/Max	-15/25	-15/25	-15/25	-15/25

1. Direct sunlight on the unit should be prevented when temperatures are higher than 43 °C. If placed under some kind of protective cover, the cover should not interfere with the flow of outdoor ventilation.

2. The gas heating units (ARG/ARD) are only appropriate for use with gas. In LPG (Liquefied Petroleum Gas, propane) installations, it must be ensured that in no case should gasoline in liquid form reach the gas group.

DB: Dry-bulb Thermometer; TH: Wet-bulb thermometer.

1.8 Capacities and application data for gas ARG/ARD

Model	Heat capacity		Gas consumption m^3/h		Rise in temperature °C	
	Total (LHV) (1) kW	Net kW	Natural gas (2)	L.P.G. propane (3)		
				Optional	Min.	Max.
017	25,6	23	2,5	1,1	11	44
022	25,6	23	2,5	1,1		
032	45,6	41	4,5	1,9		
040	45,6	41	4,5	1,9		

(1) LHV: Lower heating value.

(2) Natural gas 2ND-H, G20, at 20 mbar and 15 °C

(3) Propane gas, G31, at 37 mbar and 15 °C.

Note: The gas units are shipped ready to operate with natural gas. A conversion kit can be used to convert them to propane gas (L.P.G.).

1.9 Hot water coil, optional in ARC/ARH

ARC/ARH – 017/022, water without glycol

		Water 90/80								Water 90/75							
Air flow rate	m^3/h	2800	3000	3400	3500	4000	4300	4700	5100	2800	3000	3400	3500	4000	4300	4700	5100
Heat capacity	kW	29,1	30,4	32,6	33,2	35,8	37,3	39	40,8	27,6	28,8	31	31,5	33,9	35,3	37	38,7
Water flow rate	L/h	2470	2570	2765	2820	3035	3170	3320	3460	1560	1630	1750	1770	1900	1985	2085	2170
Pressure drops (1)	kPa	5,3	5	6,4	6,4	7,5	8,5	8,5	9,6	2,1	2,1	3,2	3,2	3,2	3,2	4,2	4,2
Air temperature rise	°K	30	29,5	28	27,5	26	25	26	23	29	28	26,5	26	25	24	23	22

		Water 90/70								Water 80/70							
Air flow rate	m^3/h	2800	3000	3400	3500	4000	4300	4700	5100	2800	3000	3400	3500	4000	4300	4700	5100
Heat capacity	kW	26,1	27,2	29,2	29,7	32	33,3	35	36,5	24,6	25,6	27,5	28	30,2	31,5	33	34,5
Water flow rate	L/h	1100	1150	1240	1255	1360	1410	1480	1545	2085	2175	2335	2380	2555	2670	2805	2930
Pressure drops (1)	kPa	1,1	1,1	2,1	2,1	2,1	2,1	2,1	2,1	4,2	4,1	5,3	5,3	5,3	6,4	6,4	7,4
Air temperature rise	°K	27	26,5	25	24,5	23	22,5	22	21	26	25	24	23	20	21	20	19

		Water 80/65								Water 80/60							
Air flow rate	m^3/h	2800	3000	3400	3500	4000	4300	4700	5100	2800	3000	3400	3500	4000	4300	4700	5100
Heat capacity	kW	23,1	2401	25,8	26,3	28,3	29,5	30,1	32,2	21,3	22,2	23,9	24,3	26,3	27,4	28,7	30
Water flow rate	L/h	1305	1360	1460	1485	1600	1670	1750	1830	910	945	1015	1035	1115	1160	1220	1275
Pressure drops (1)	kPa	2,1	2,1	2,1	2,1	2,1	3,1	3,2	3,2	1	1	1,1	1,1	1,1	1,1	1,1	1,1
Air temperature rise	°K	24	23	22	22	21	20	19	18	23	22	21	20	19	19	18	17

		Water 70/60								Water 70/55							
Air flow rate	m^3/h	2800	3000	3400	3500	4000	4300	4700	5100	2800	3000	3400	3500	4000	4300	4700	5100
Heat capacity	kW	20	21	22,5	22,9	24,6	25,6	26,9	28,1	18,4	19,2	20,6	21	22,6	23,6	24,7	25,8
Water flow rate	L/h	1705	1780	1900	1950	2085	2170	2275	2380	1045	1090	1170	1190	1285	1335	1400	1460
Pressure drops (1)	kPa	3,1	3,2	3,2	3,2	4,2	4,2	5,3	5,3	1,1	1,1	1,1	1,1	2,1	2,1	2,1	2,1
Air temperature rise	°K	21	20	21	21	18	18	17	16	19	18	17	17	16	16	15	14

		70/50								Water 60/50							
Air flow rate	m^3/h	2800	3000	3400	3500	4000	4300	4700	5100	2800	3000	3400	3500	4000	4300	4700	5100
Heat capacity	kW	16,6	17,3	18,6	18,9	20,4	21,2	22,2	23,2	15,5	16,2	17,4	17,7	19	19,8	20,8	21,7
Water flow rate	L/h	705	735	790	805	865	905	945	990	1310	1370	1475	1505	1625	1690	1765	1845
Pressure drops (1)	kPa	1	1	1	1	1	1	1	1	2,1	2,1	2,1	2,1	3,1	3,1	3,2	3,2
Air temperature rise	°K	17	17	16	16	15	15	14	13	16	16	15	15	14	14	13	12

- Pressure drop of coil + valve.

(1) - Coil air inlet: 18 °C.

- Total volume of water in circuit: 3 l.

ARC/ARH – 017/022, water and glycol mix 35%

		Water 90/80								Water 90/75							
Air flow rate	m^3/h	2800	3000	3400	3500	4000	4300	4700	5100	2800	3000	3400	3500	4000	4300	4700	5100
Heat capacity	kW	28,6	29,9	32,1	32,6	35,2	36,6	38,4	40,2	26,8	28	30,1	30,6	33	34,4	36,1	37,6
Water flow rate	L/h	2700	2820	3035	3075	3330	3455	3630	3800	1690	1760	1890	1920	2080	2165	2275	2350
Pressure drops (1)	kPa	7,4	7,4	8,5	8,5	9,5	10,6	11,7	12,7	3,1	3,2	4,2	4,2	4,2	5,2	5,3	5,3
Air temperature rise	°K	30	29	28	27	26	25	24	23	28	27	26	25	24	23	22	21

		Water 90/70								Water 80/70							
Air flow rate	m^3/h	2800	3000	3400	3500	4000	4300	4700	5100	2800	3000	3400	3500	4000	4300	4700	5100
Heat capacity	kW	24,8	25,8	27,7	28,2	30,4	31,7	33,2	34,8	24	25,1	27	27,4	29,5	30,8	32,3	33,7
Water flow rate	L/h	1235	1220	1310	1330	1435	1500	1570	1640	2270	2365	2570	2590	2800	2925	3060	3200
Pressure drops (1)	kPa	2,1	2,1	2,1	2,1	2,1	2,1	3,1	3,1	5,3	5,3	6,3	6,3	7,4	8,4	8,5	9,5
Air temperature rise	°K	26	25	24	23	22	22	21	20	25	24	23	23	22	21	20	19

		Water 80/65								Water 80/60							
Air flow rate	m^3/h	2800	3000	3400	3500	4000	4300	4700	5100	2800	3000	3400	3500	4000	4300	4700	5100
Heat capacity	kW	22	22,9	24,6	25	27	28,1	29,6	30,9	19,8	20,6	22,2	22,6	24,3	25,4	26,6	27,8
Water flow rate	L/h	1400	1450	1550	1570	1705	1775	1870	1950	940	980	1055	1070	1155	1210	1260	1315
Pressure drops (1)	kPa	2,1	2,1	3,1	3,1	3,1	3,2	4,2	4,2	1	1	1,1	1,1	2,1	2,1	2,1	2,1
Air temperature rise	°K	23	22	21	21	20	19	18	17	21	20	19	19	18	17	16	16

		Water 70/60								Water 70/55							
Air flow rate	m^3/h	2800	3000	3400	3500	4000	4300	4700	5100	2800	3000	3400	3500	4000	4300	4700	5100
Heat capacity	kW	19,3	20,1	21,6	22	23,8	24,8	26	27,2	17,1	17,8	19,1	19,5	21	21,9	23	24,1
Water flow rate	L/h	1850	1925	2070	2105	2280	2345	2465	2585	1080	1130	1215	1235	1340	1395	1465	1535
Pressure drops (1)	kPa	4,2	4,2	4,2	5,2	5,3	5,3	6,3	7,3	1,1	2,1	2,1	2,1	2,1	2,1	2,1	3,1
Air temperature rise	°K	20	20	19	18	17	17	16	15	18	17	16	16	15	15	14	14

		Water 70/50								Water 60/50							
Air flow rate	m^3/h	2800	3000	3400	3500	4000	4300	4700	5100	2800	3000	3400	3500	4000	4300	4700	5100
Heat capacity	kW	11,6	13,3	16,1	16,4	17,8	18,6	19,5	20,5	14,5	15,1	16,2	16,5	17,8	18,6	19,5	20,4
Water flow rate	L/h	555	635	770	785	850	890	930	980	1385	1450	1555	1585	1710	1785	1870	1965
Pressure drops (1)	kPa	1	1	1	1	1	1	1	1	2,1	2,1	3,1	3,1	3,1	4,2	4,2	4,2
Air temperature rise	°K	15	15	14	14	13	13	12	12	15	15	14	14	13	13	12	12

- Pressure drop of coil + valve.

(1) - Coil air inlet: 18 °C.

- Total volume of water in circuit: 3 l.

ARC/ARH – 032/040, water without glycol

		Water 90/80								Water 90/75							
Air flow rate	m^3/h	4700	5000	5700	6200	6800	7400	8000	8600	4700	5000	5700	6200	6800	7400	8000	8600
Heat capacity	kW	50,2	52,1	56,4	59,2	62,3	65,4	68,2	71	47,8	49,5	53,6	56,2	59,2	62,1	64,7	67,4
Water flow rate	L/h	4250	4420	4775	5025	5280	5545	5780	6020	2710	2790	3020	3165	3330	3500	3645	3790
Pressure drops (1)	kPa	11	12	14	15,2	16,4	18,5	19,6	20,8	5,4	5,4	6,5	6,5	7,5	7,6	8,7	9,7
Air temperature rise	°K	31	30	29	28	27	26	25	24	30	29	28	27	26	25	24	23

		Water 90/70								Water 80/70							
Air flow rate	m^3/h	4700	5000	5700	6200	6800	7400	8000	8600	4700	5000	5700	6200	6800	7400	8000	8600
Heat capacity	kW	45,4	47,1	50,8	53,3	56,1	58,8	59,2	61,6	41,6	43,2	46,7	49	51,6	54,1	56,4	58,7
Water flow rate	L/h	1920	1990	2150	2260	2375	2490	2505	2610	3520	3645	3955	4140	4365	4590	4770	4975
Pressure drops (1)	kPa	3,2	3,2	3,2	4,3	4,3	4,3	5,3	6,3	10,6	10,7	13	14	15	16	17	18,2
Air temperature rise	°K	28	27	26	25	24	23	22	21	26	25	24	23	22	21	21	20

		Water 80/65								Water 80/60							
Air flow rate	m^3/h	4700	5000	5700	6200	6800	7400	8000	8600	4700	5000	5700	6200	6800	7400	8000	8600
Heat capacity	kW	38,9	40,3	43,6	45,7	48,1	50,4	52,5	54,6	36,1	37,4	40,4	42,3	44,5	46,6	45,5	50,5
Water flow rate	L/h	2200	2275	2460	2580	2715	2850	2970	3085	1530	1585	1715	1800	1890	1980	2050	2145
Pressure drops (1)	kPa	4,2	4,3	5,3	6,3	6,4	7,4	7,4	8,5	2,1	2,1	3,1	3,2	3,2	4,2	4,2	4,2
Air temperature rise	°K	24	24	23	23	22	22	21	20	23	22	21	20	19	19	18	17

		Water 70/60								Water 70/55							
Air flow rate	m^3/h	4700	5000	5700	6200	6800	7400	8000	8600	4700	5000	5700	6200	6800	7400	8000	8600
Heat capacity	kW	33,8	35,1	38	39,8	41,9	43,9	45,8	47,7	31,1	32,2	34,8	36,5	38,3	40,2	42	43,6
Water flow rate	L/h	2850	2970	3215	3360	3545	3710	3880	4040	1765	1830	1965	2070	2170	2270	2380	2460
Pressure drops (1)	kPa	7,5	7,5	8,5	10	11	12	12,7	13	3,2	3,2	4,2	4,2	4,2	5,3	5,3	5,3
Air temperature rise	°K	21	21	20	19	18	18	17	16	20	19	18	17	16	16	15	15

		70/50								Water 60/50							
Air flow rate	m^3/h	4700	5000	5700	6200	6800	7400	8000	8600	4700	5000	5700	6200	6800	7400	8000	8600
Heat capacity	kW	27,8	28,8	31,1	32,7	34,4	36,1	37,7	39,2	26,1	27,1	29,3	30,7	32,3	33,9	35,3	36,7
Water flow rate	L/h	1180	1225	1330	1390	1460	1540	1600	1670	2220	2300	2490	2615	2740	2880	3010	3120
Pressure drops (1)	kPa	1,1	2,1	2,1	2,1	2,1	2,1	3,1	3,1	5,2	5,3	6,5	6,5	7,5	7,5	8,4	8,5
Air temperature rise	°K	17	17	16	15	15	14	14	13	16	16	15	15	14	13	13	12

- Pressure drop of coil + valve.

(1) - Coil air inlet: 18 °C.

- Total volume of water in circuit: 4,5 l.

ARC/ARH – 032/040, water and glycol mix 35%

		Water 90/80								Water 90/75							
Air flow rate	m^3/h	4700	5000	5700	6200	6800	7400	8000	8600	4700	5000	5700	6200	6800	7400	8000	8600
Heat capacity	kW	48,4	50,2	54,3	57	60	62,9	65,6	68,2	45,3	46,9	50,7	53,2	56	58,6	61,1	63,4
Water flow rate	L/h	4575	4690	5115	5370	5660	5940	6190	6440	2850	2950	3190	3345	3520	3695	3845	3965
Pressure drops (1)	kPa	18	18,2	21,3	23,4	25,6	27,7	30	32	7,4	8,4	9,5	10,6	11,6	12,7	12,7	13,8
Air temperature rise	°K	30	29	28	27	26	25	24	23	28	27	26	25	24	23	22	22

		Water 90/70								Water 80/70							
Air flow rate	m^3/h	4700	5000	5700	6200	6800	7400	8000	8600	4700	5000	5700	6200	6800	7400	8000	8600
Heat capacity	kW	41,5	43,1	46,7	49,1	51,7	54,2	56,6	58,8	40,5	42,1	45,4	47,7	50,2	52,6	54,8	57,1
Water flow rate	L/h	1955	2030	2200	2315	2440	2565	2675	2760	3830	4010	4270	4495	4740	4980	5180	5410
Pressure drops (1)	kPa	4,2	4,2	5,2	5,3	6,3	6,3	7,4	7,4	13,7	14,8	16	18	19	21,2	22,3	24,4
Air temperature rise	°K	26	25	24	23	22	21	21	20	25	24	23	22	21	21	20	19

		Water 80/65								Water 80/60							
Air flow rate	m^3/h	4700	5000	5700	6200	6800	7400	8000	8600	4700	5000	5700	6200	6800	7400	8000	8600
Heat capacity	kW	37	38,4	41,7	43,7	46	48,2	50,3	52,3	33	34,2	37,1	38,8	40,1	42,9	44,6	46,4
Water flow rate	L/h	2345	2440	2635	2770	2905	3040	3175	3305	1560	1625	1760	1845	1940	2040	2110	2200
Pressure drops (1)	kPa	5,3	6,3	7,3	7,4	8,4	8,5	9,5	10,5	3,1	3,1	3,2	4,2	4,2	4,2	5,2	5,2
Air temperature rise	°K	23	22	21	21	20	19	18	18	21	20	19	18	18	17	16	16

		Water 70/60								Water 70/55							
Air flow rate	m^3/h	4700	5000	5700	6200	6800	7400	8000	8600	4700	5000	5700	6200	6800	7400	8000	8600
Heat capacity	kW	32,7	33,9	36,7	38,5	41,2	42,3	44,1	46	28,6	29,6	32	33,6	35,3	37,1	38,7	40,2
Water flow rate	L/h	3125	3240	3520	3690	3900	4000	1585	4370	1820	1890	2030	2135	2240	2370	2470	2570
Pressure drops (1)	kPa	9,5	10,5	11,6	12,7	13,8	14,8	15,1	16,9	4,2	4,2	4,2	5,2	5,2	6,3	6,3	7,3
Air temperature rise	°K	21	20	19	18	17	17	16	15	18	17	16	16	15	15	14	14

		70/50								Water 60/50							
Air flow rate	m^3/h	4700	5000	5700	6200	6800	7400	8000	8600	4700	5000	5700	6200	6800	7400	8000	8600
Heat capacity	kW	23,9	24,8	27	28,3	29,8	31,3	32,7	34,1	24,4	25,2	247	28,6	30,1	31,6	33	34,3
Water flow rate	L/h	1140	1190	1290	1360	1425	1490	1560	1630	2350	2430	2625	2730	2880	3035	3170	3290
Pressure drops (1)	kPa	2,1	2,1	2,1	2,1	2,1	3,1	3,1	3,1	6,3	6,3	7,3	8,4	8,4	9,5	10,5	10,5
Air temperature rise	°K	15	14	14	13	13	12	12	11	15	15	14	14	13	13	12	12

- Pressure drop of coil + valve.

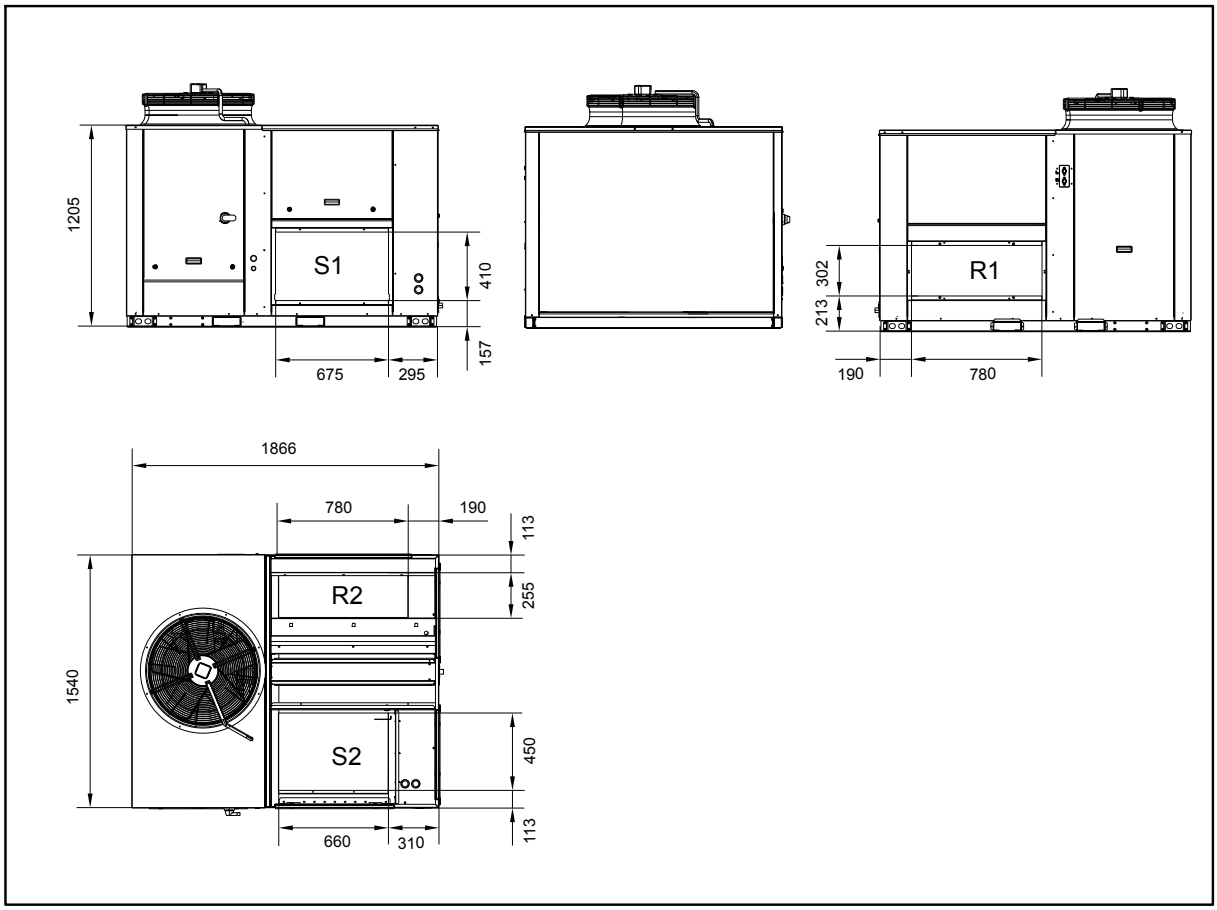
(1) - Coil air inlet: 18 °C.

- Total volume of water in circuit: 4,5 l.

1.10 Measurements, clearances and accesses

1.10.1 Dimensions of the duct connections

Models 017/022

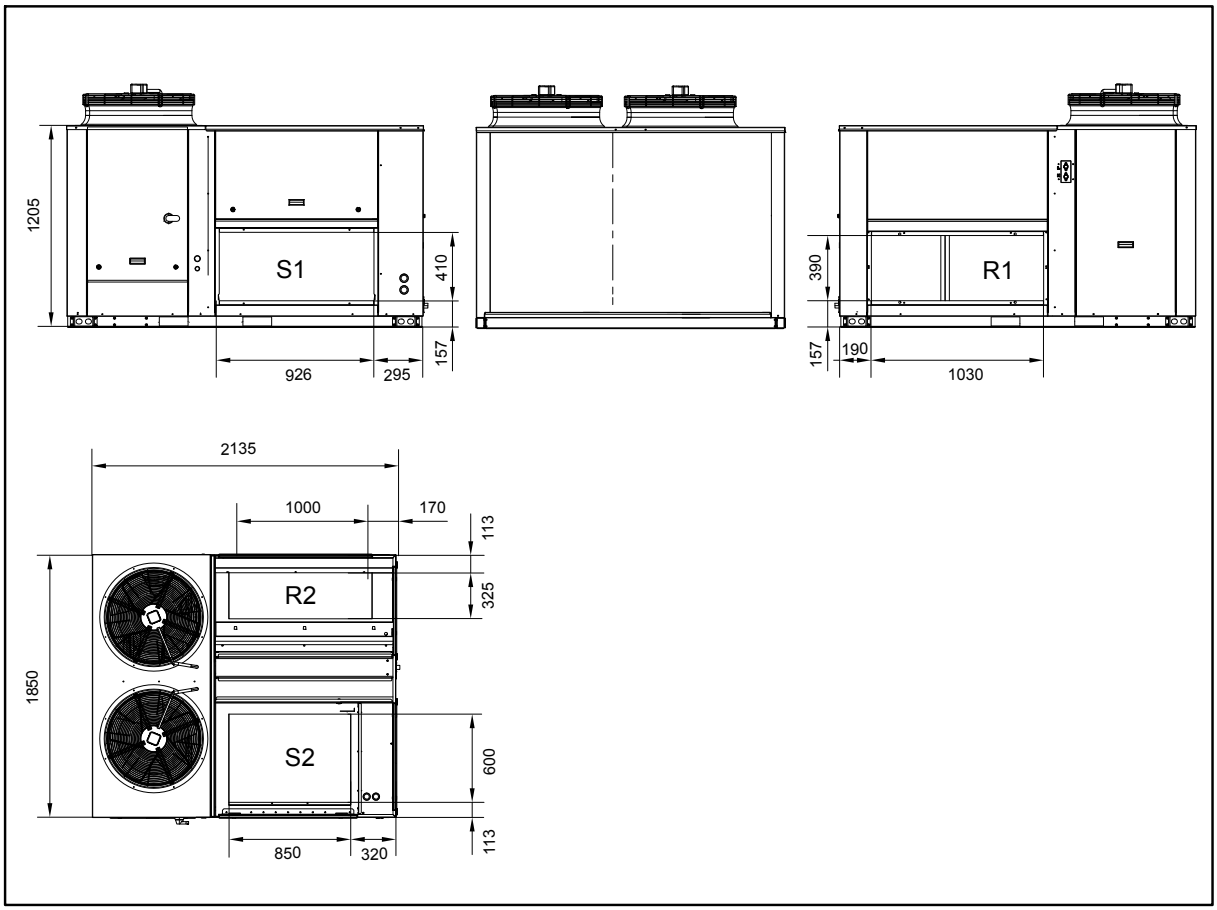


NOTE

Floor plan without the top panel

S1	Lateral supply	S2	Bottom supply
R1	Lateral return	R2	Lower return

Models 032/040



NOTE

Floor plan without the top panel

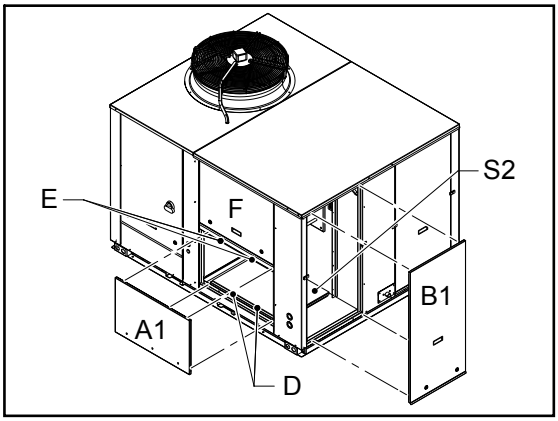
S1	Lateral supply	S2	Bottom supply
R1	Lateral return	R2	Lower return

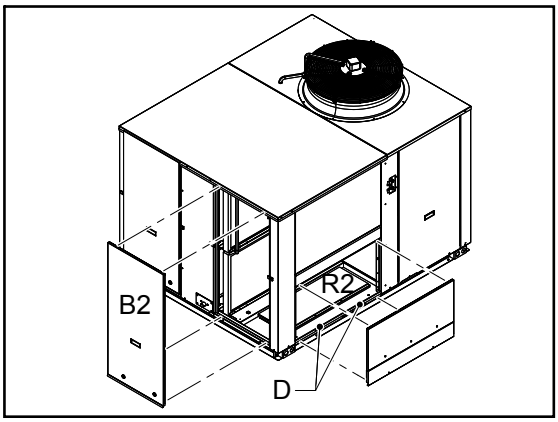
1.10.2 Connections for supply and return ducts

Units are shipped with the connection duct openings covered.

For applications with downward discharge ducts

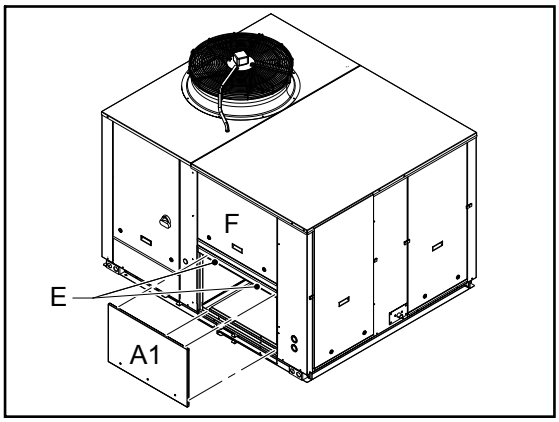
1. If the unit does not incorporate heating element, hot water coil or gas heating options, access the supply compartment by removing the access panel **-B1-**.
   The return compartment is accessed in all cases by removing the access panel **-B2-**.
2. Remove and set aside the lower covers of the ducts **-S2-** (supply) and **-R2-** (return). In order to do this, loosen the two bolts **-D-** that fix each cover to the base.
3. If the unit is fitted with any of the aforementioned heating options, the supply compartment cannot be accessed through panel **-B1-**. In that case, access it via the access panel **-F-** and loosen the two bolts **-E-** from the inside in order to remove the side panel **-A1-**. This gives access to remove the lower cover of the duct **-S2-** (supply).
4. After removing the lower covers, reattach the side panels to both compartments ensuring that the seal is hermetic.

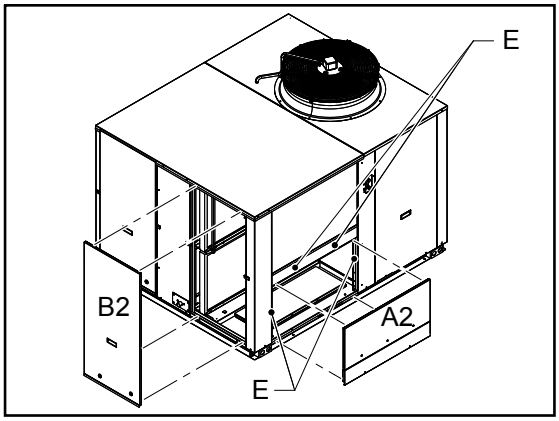




For applications with sideways discharge ducts

1. Access the supply compartment via the access panel **-F-** and loosen the two bolts **-E-** from the inside.
2. Remove and dispose of the side cover **-A1-**.
3. Access the return compartment via the access panel **-B2-** and loosen the four bolts **-E-** from the inside.
4. Remove and dispose of the side cover **-A2-**.
5. After removing the side covers, reattach the access panels to both compartments ensuring that the seal is hermetic.





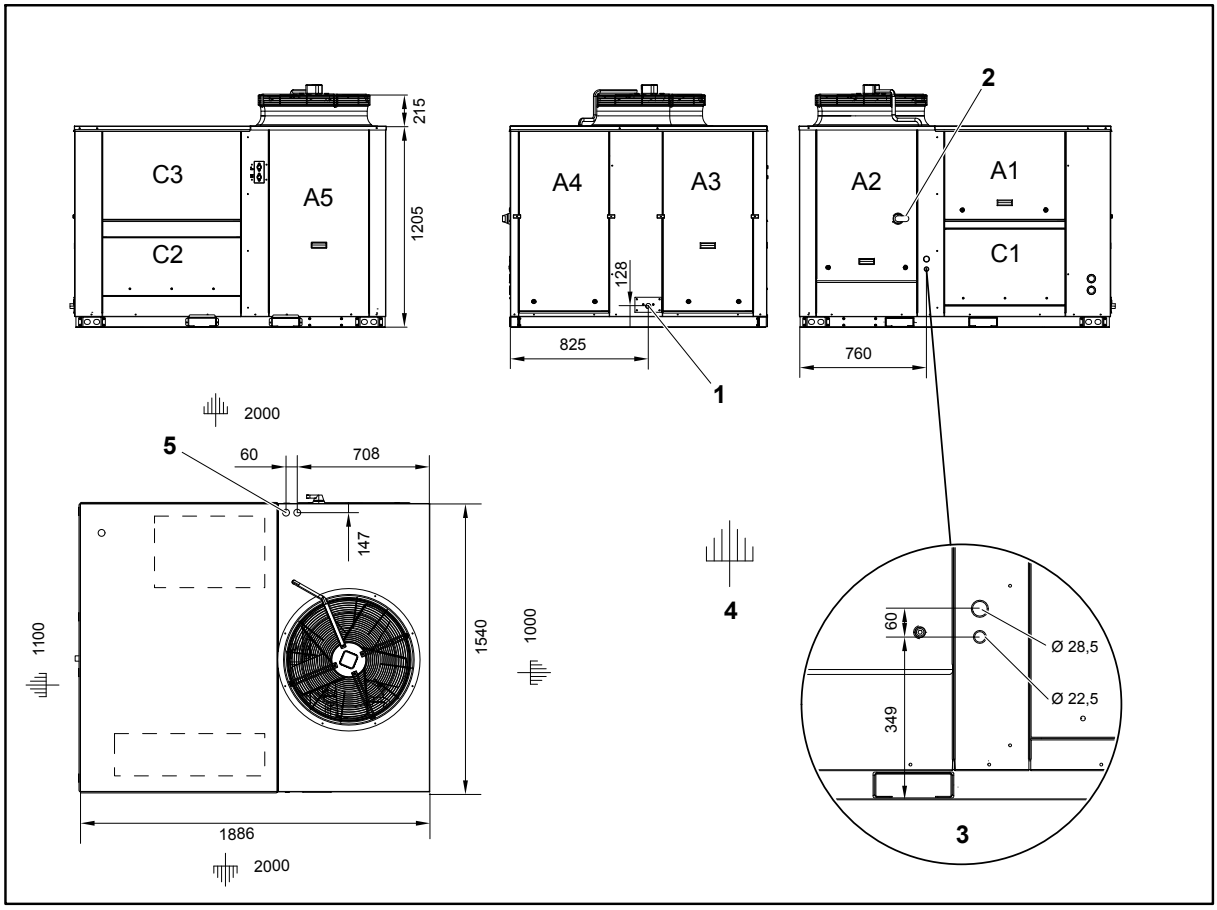
1.10.3 General measurements and accesses

Minimum clearance above the unit

The unit is designed to be installed outdoors.

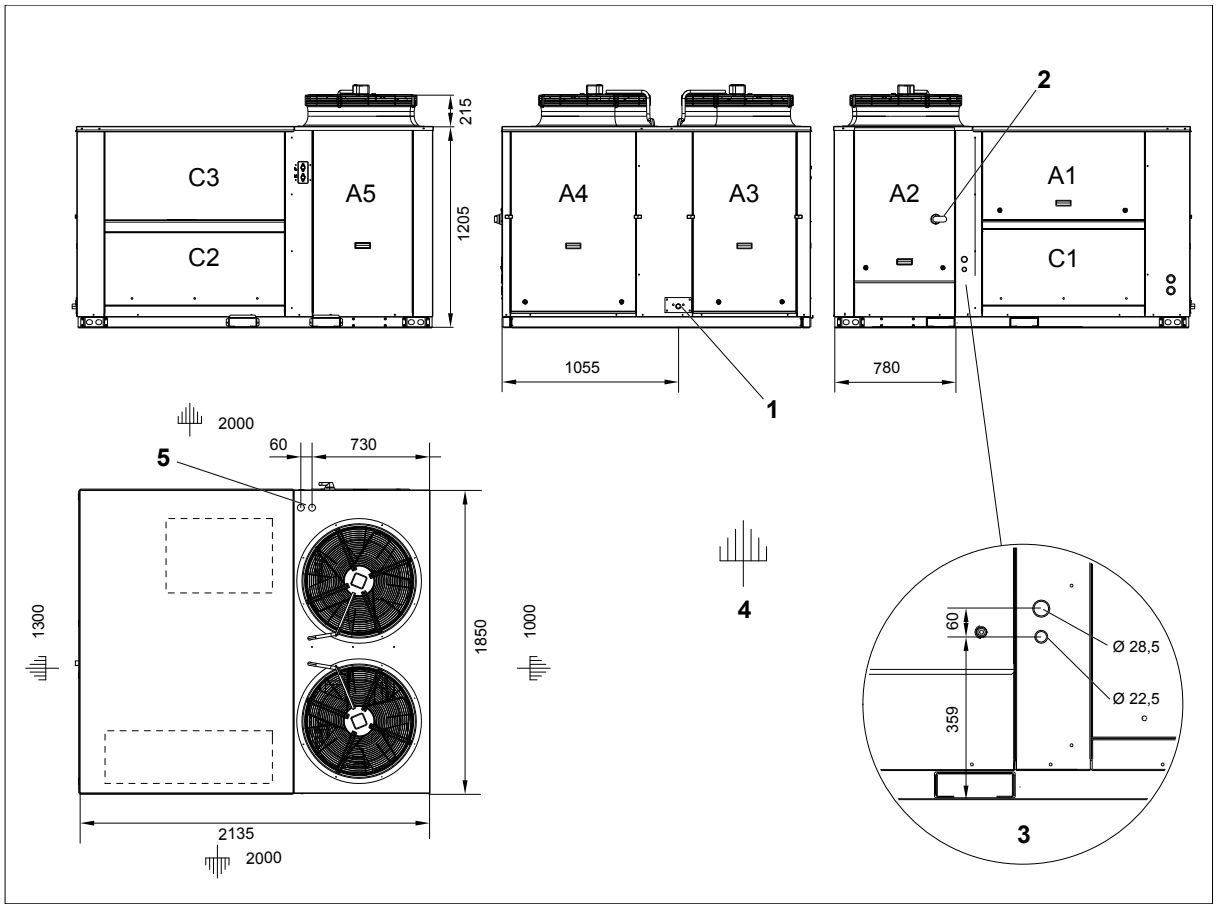
In ground level installations, the building eaves must not be at a vertical distance of less than 3000 mm from the top of the unit.

Models ARC/ARH - 017/022



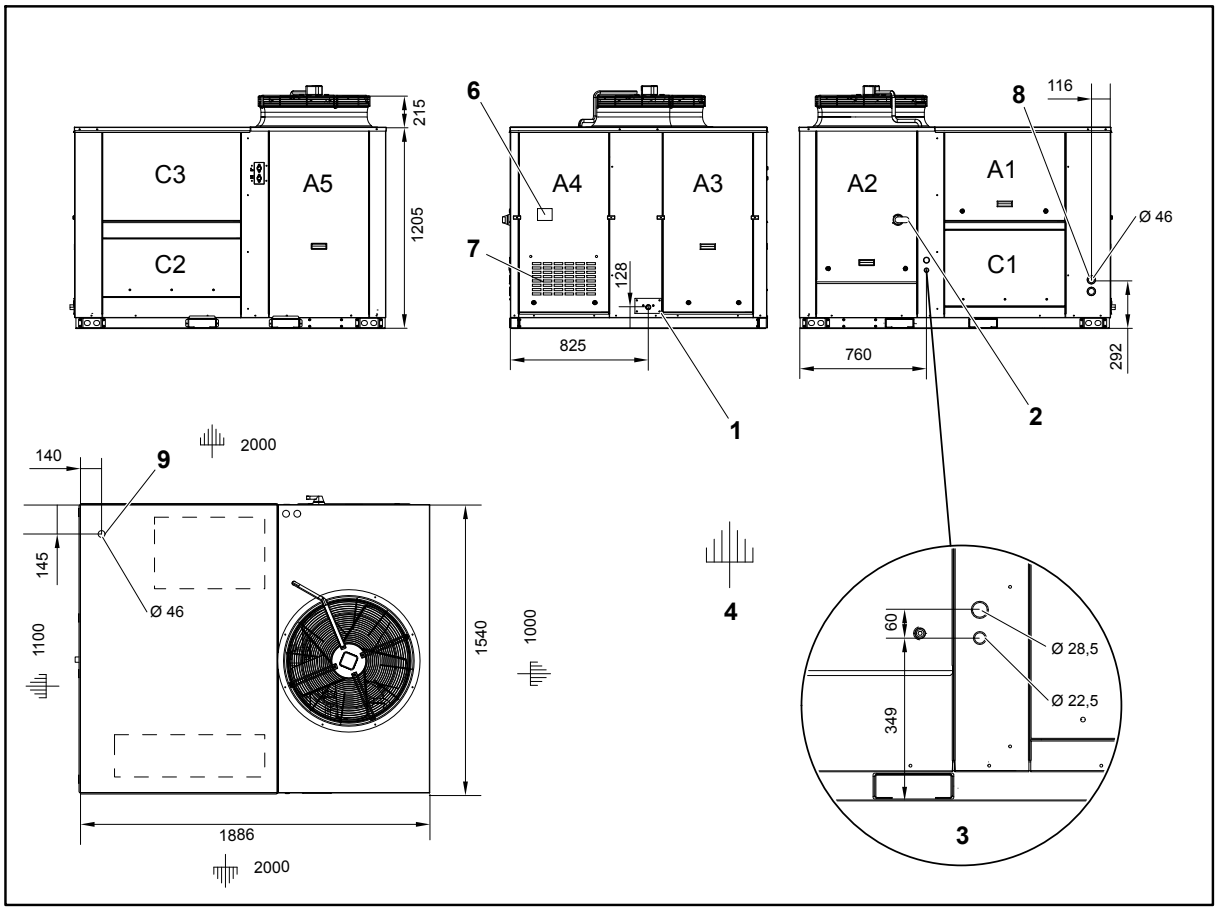
A1. Access to indoor/supply fan
A2. Access to electrical box
A3. Access to return/economiser/filters
A4. Access to heating/supply options
A5. Access to cooling circuit
C1. Supply side cover
C2. Return side cover / exhaust options
C3. Outdoor air inlet cover, optional
1. Drain connection ∅ 28,5 x 25 Long
2. Main switch
3. Side inlets for power and control cables
4. Instructions for minimum free space around the unit
5. Inlet in the base for power and control cables (PG29 and PG16)

Models ARC/ARH - 032/040



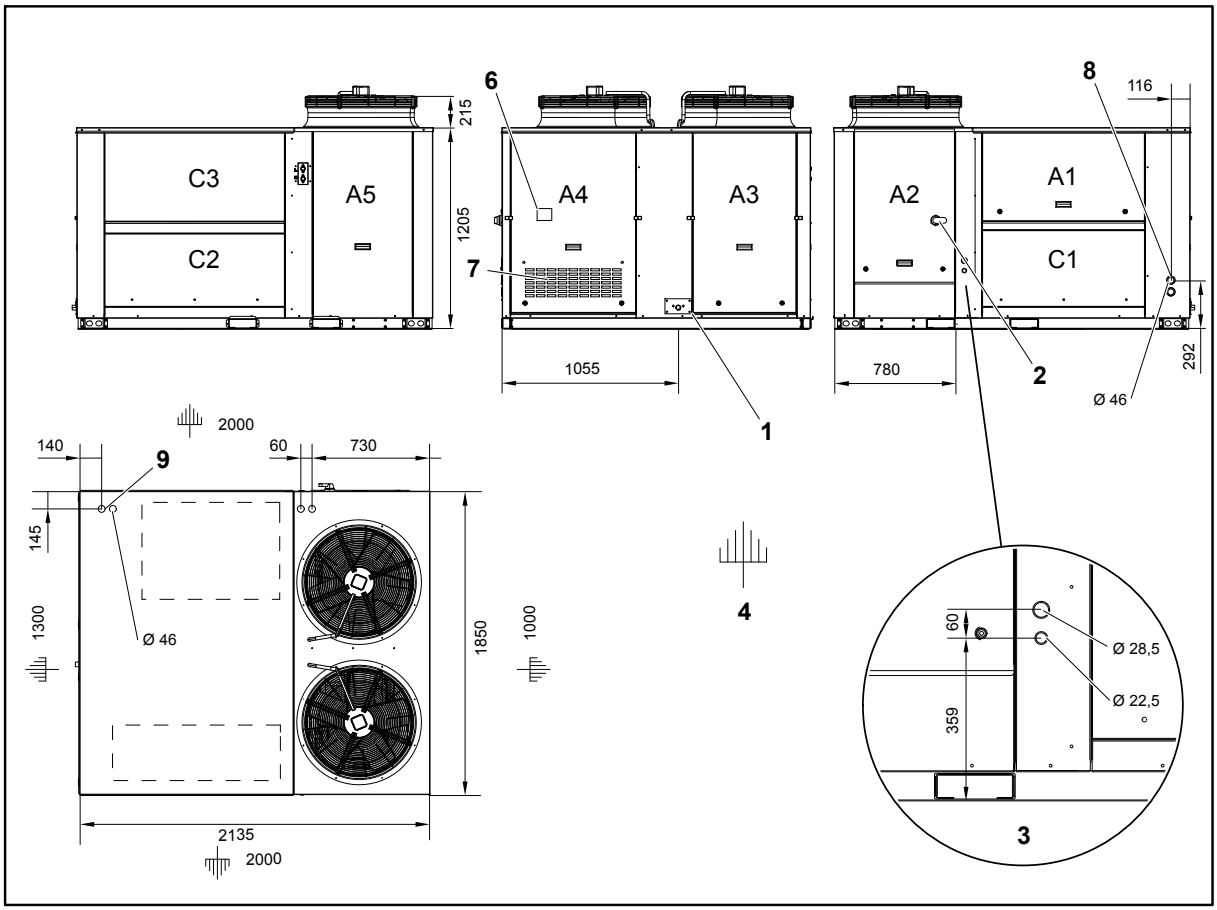
A1. Access to indoor/supply fan
A2. Access to electrical box
A3. Access to return/economiser/filters
A4. Access to heating/supply options
A5. Access to cooling circuit
C1. Supply side cover
C2. Return side cover / exhaust options
C3. Outdoor air inlet cover, optional
1. Drain connection ∅ 28,5 x 25 Long
2. Main switch
3. Side inlets for power and control cables
4. Instructions for minimum free space around the unit
5. Inlet in the base for power and control cables (PG29 and PG16)

Models ARG/ARD - 017/022



A1. Access to indoor/supply fan
A2. Access to electrical box
A3. Access to return/economiser/filters
A4. Access to gas heating section
A5. Access to cooling circuit
C1. Supply side cover
C2. Return side cover / exhaust options
C3. Outdoor air inlet cover, optional
1. Drain connection ∅ 28,5 x 25 Long
2. Main switch
3. Side inlets for power and control cables
4. Instructions for minimum free space around the unit
5. Inlet in the base for power and control cables (PG29 and PG16)
6. Outlet for burnt gases
7. Combustion air inlet
8. Side inlet for gas supply pipe
9. Inlet in the base for gas supply pipe

Models ARG/ARD - 032/040



A1. Access to indoor/supply fan
A2. Access to electrical box
A3. Access to return/economiser/filters
A4. Access to gas heating section
A5. Access to cooling circuit
C1. Supply side cover
C2. Return side cover / exhaust options
C3. Outdoor air inlet cover, optional

1. Drain connection ∅ 28,5 x 25 Long
2. Main switch
3. Side inlets for power and control cables
4. Instructions for minimum free space around the unit
5. Inlet in the base for power and control cables (PG29 and PG16)
6. Outlet for burnt gases
7. Combustion air inlet
8. Side inlet for gas supply pipe
9. Inlet in the base for gas supply pipe

1.11 ARC/ARG Performance

1.11.1 ARC/ARG 017 cooling capacities

Return air		Outdoor coil air temperature (TS)																	
Flow rate m^3/h	TH °C	27 °C						35 °C						46 °C					
		PT kW	PC kW	Sensible power kW				PT kW	PC kW	Sensible power kW				PT kW	PC kW	Sensible power kW			
				TS inlet temp. in indoor coil						TS inlet temp. in indoor coil						TS inlet temp. in indoor coil			
				22	24	27	30			22	24	27	30			22	24	27	30
(Minimum) 2800	23	20,8	4,6	–	7,2	9,9	12,8	19,8	5	–	6,8	9,6	12,4	17,8	5,5	–	6,2	9	11,8
	19	18,9	4,4	9,5	11,4	14,1	16,9	17,8	4,8	9,1	10,9	13,8	16,5	16	5,2	8,4	10,3	13,1	15,9
	17	17,8	4,3	11,8	13,4	16,2	17,8	16,4	4,8	11	12,8	15,5	16,4	14,6	5,1	10,2	12,1	14,6	14,6
	15	16	4,3	13,1	15	16	16	15,3	4,7	12,8	14,6	15,3	15,3	13,7	5,1	12,1	13,7	13,7	13,7
(Nominal) 3400	23	21,2	4,7	–	7,3	10,7	14,1	20,2	5,1	–	7	10,4	13,7	18,2	5,6	–	6,4	9,7	13,1
	19	19,3	4,5	10,1	12,3	15,7	19,1	18,2	4,9	9,6	11,9	15,3	18,2	16,4	5,3	9	11,2	14,6	16,4
	17	18,2	4,4	12,9	14,8	18,1	18,2	16,7	4,9	12,1	14,1	16,7	16,7	14,9	5,2	11,1	13,4	14,9	14,9
	15	16,4	4,4	14,5	16,4	16,4	16,4	15,6	4,8	14,1	15,6	15,6	15,6	14	5,2	13,5	14	14	14
(Maximum) 4000	23	21,5	4,8	–	7,5	11,4	15,4	20,4	5,3	–	7,1	11,1	15	18,4	5,9	–	6,6	10,5	14,4
	19	19,5	4,7	10,6	13,2	17,2	19,5	18,4	5,1	10,2	12,8	16,8	18,4	16,5	5,5	9,6	12,2	16,1	16,5
	17	18,4	4,6	14,2	16	18,4	18,4	16,9	5	13,1	15,4	16,9	16,9	15,1	5,5	12,1	14,8	15,1	15
	15	16,5	4,5	15,8	16,5	16,5	16,5	15,8	4,9	15,5	15,8	15,8	15,8	14,2	5,4	14,7	14,2	14,2	14,1

* Data in accordance with Eurovent Rooftop program certification conditions

PT: Total Power; PC: Power absorbed by the compressor

WB: Wet-bulb temperature; TS: Dry bulb temperature.

1.11.2 ARC/ARG 022 cooling capacities

Return air		Outdoor coil air temperature (TS)																	
Flow rate m^3/h	TH °C	27 °C						35 °C						46 °C					
		PT kW	PC kW	Sensible power kW				PT kW	PC kW	Sensible power kW				PT kW	PC kW	Sensible power kW			
				TS inlet temp. in indoor coil						TS inlet temp. in indoor coil						TS inlet temp. in indoor coil			
				22	24	27	30			22	24	27	30			22	24	27	30
(Minimum) 3500	23	25,4	5,9	–	8,8	12,2	15,7	24,1	6,4	–	8,3	11,8	15,2	21,7	7,1	–	7,6	11	14,5
	19	23	5,7	11,6	13,9	17,4	20,9	21,7	6,2	11,1	13,5	16,9	20,3	19,5	6,7	10,3	12,6	16,1	19,5
	17	21,7	5,6	14,7	16,5	19,9	21,7	20	6,1	13,6	15,7	19,1	20	17,8	6,6	12,5	14,8	17,8	17,8
	15	19,6	5,5	16,2	18,5	19,6	19,6	18,7	6	1,57	17,9	18,7	18,7	16,7	6,6	14,8	16,7	16,7	16,7
(Nominal) 4300	23	26	5,9	–	9	13,2	17,4	24,7	6,4	–	8,5	12,8	17	22,2	7,1	–	7,8	12	16,2
	19	23,5	5,7	12,4	15,2	19,4	23,5	22,2	6,2	11,9	14,7	18,9	22,2	20	6,7	11,1	13,9	18,1	20
	17	22,2	5,6	16,3	18,3	22,2	22,2	20,4	6,1	15	17,4	20,4	20,4	18,2	6,6	13,8	16,6	18,2	18,2
	15	20	5,5	17,9	20	20	20	19,1	6	17,4	19,1	19,1	19,1	17,1	6,6	16,6	17,1	17,1	17,1
(Maximum) 5100	23	26,8	6,1	–	9,2	14,1	19,1	25	6,7	–	8,7	13,7	18,7	22,5	7,4	–	8	13	17,9
	19	23,9	5,9	13,1	16,4	21,4	23,9	22,5	6,4	12,6	15,9	20,9	22,5	20,3	6,9	11,8	15,1	20,1	20,2
	17	22,5	5,8	18,1	20	22,5	22,5	20,7	6,3	16,5	19,2	20,7	20,7	18,5	6,8	15	18,3	18,5	18,5
	15	20,3	5,7	19,6	20,2	20,2	20,3	19,4	6,2	19,2	19,3	19,3	19,4	17,4	6,8	17,3	17,3	17,4	17,4

* Data in accordance with Eurovent Rooftop program certification conditions

PT: Total Power; PC: Power absorbed by the compressor

WB: Wet-bulb temperature; TS: Dry bulb temperature.

1.11.3 ARC/ARG 032 cooling capacities

Return air		Outdoor coil air temperature (TS)																	
		27 °C						35 °C						46 °C					
Flow rate m^3/h	TH °C	PT kW	PC kW	Sensible power kW				PT kW	PC kW	Sensible power kW				PT kW	PC kW	Sensible power kW			
				TS inlet temp. in indoor coil						TS inlet temp. in indoor coil						TS inlet temp. in indoor coil			
				22	24	27	30			22	24	27	30			22	24	27	30
(Minimum) 4700	23	35,5	7,7	–	12,3	16,9	21,6	33,7	8,4	–	11,6	16,3	20,9	30,3	9,3	–	10,5	15,2	19,9
	19	32,1	7,5	16,1	19,3	23,9	28,6	30,3	8,1	15,4	18,5	23,2	27,8	27,3	8,7	14,3	17,4	22,0	26,7
	17	30,3	7,3	20,1	22,7	27,3	30,3	27,9	8,0	18,7	21,5	26,2	27,9	24,5	8,7	17,2	20,3	24,8	24,8
	15	27,3	7,2	22,2	25,3	27,3	27,3	26,1	7,9	21,5	24,6	26,1	26,1	23,3	8,6	20,4	23,3	23,3	23,3
(Nominal) 5700	23	36,2	7,8	–	12,5	18,1	23,7	34,4	8,5	–	11,9	17,5	23,1	31,0	9,4	–	10,8	16,4	22,1
	19	32,8	7,5	17,1	20,8	26,4	32,0	31,0	8,2	16,3	20,1	25,7	31,0	29,9	8,9	15,2	19,0	24,6	27,9
	17	31,0	7,4	22,2	24,9	30,5	31,0	28,5	8,1	20,5	23,7	28,5	28,5	25,4	8,8	18,8	22,5	25,4	25,4
	15	27,9	7,3	24,4	27,9	27,9	27,9	26,6	8,0	23,7	26,6	26,6	26,6	23,8	8,7	22,6	23,8	23,8	23,8
(Maximum) 6800	23	37,2	7,8	–	12,9	19,6	26,2	35,3	8,5	–	12,3	18,9	25,6	31,8	9,4	–	11,3	17,9	24,5
	19	33,7	7,5	18,2	22,6	29,3	33,7	31,8	8,2	17,5	21,9	28,5	31,8	28,6	8,9	16,4	20,8	27,5	28,6
	17	31,8	7,4	24,7	27,4	31,8	31,8	29,3	8,1	22,6	26,3	29,3	29,3	26,1	8,8	20,7	25,1	26,1	26,1
	15	28,6	7,3	26,9	28,6	28,6	28,6	27,4	8,0	26,3	27,4	27,4	27,4	24,5	8,7	24,5	24,5	24,5	24,5

* Data in accordance with Eurovent Rooftop program certification conditions

PT: Total Power; PC: Power absorbed by the compressor

WB: Wet-bulb temperature; TS: Dry bulb temperature.

1.11.4 ARC/ARG 040 cooling capacities

Return air		Outdoor coil air temperature (TS)																	
		27 °C						35 °C						46 °C					
Flow rate m^3/h	TH °C	PT kW	PC kW	Sensible power kW				PT kW	PC kW	Sensible power kW				PT kW	PC kW	Sensible power kW			
				TS inlet temp. in indoor coil						TS inlet temp. in indoor coil						TS inlet temp. in indoor coil			
				22	24	27	30			22	24	27	30			22	24	27	30
(Minimum) 6200	23	44,8	11,4	–	15,4	21,5	27,6	42,5	12,5	–	14,6	20,7	26,8	38,3	13,8	–	13,3	19,4	25,5
	19	40,5	11,0	20,5	24,5	30,6	36,7	38,3	12,0	19,5	23,6	29,7	35,8	34,4	13,0	18,2	22,2	28,3	34,4
	17	38,3	10,8	26,3	28,9	35,0	38,3	35,2	11,9	24,2	27,5	33,6	35,2	31,4	12,8	22,0	26,0	31,4	31,4
	15	34,4	10,7	28,3	32,4	34,4	34,4	32,9	11,6	27,5	31,6	32,9	32,9	39,4	12,7	26,1	29,4	29,4	29,5
(Nominal) 7400	23	46,6	11,4	–	16,1	23,3	30,5	44,2	12,5	–	15,3	22,5	29,6	39,9	13,8	–	14,0	21,1	28,3
	19	42,2	11,0	21,9	26,7	33,9	41,1	39,9	12,0	21,0	25,8	33,0	39,9	35,9	13,0	16,6	24,4	31,6	35,9
	17	39,9	10,8	29,3	31,9	39,1	39,9	36,7	11,9	26,7	30,5	36,7	36,7	32,7	12,8	24,2	28,9	32,7	32,7
	15	35,9	10,7	31,3	35,9	35,9	35,9	34,3	11,6	30,5	34,3	34,3	34,3	30,7	12,7	29,0	30,7	30,7	30,7
(Maximum) 8600	23	47,3	11,6	–	16,4	24,7	32,9	44,9	12,7	–	15,6	23,9	31,1	40,4	14,0	–	14,3	22,6	30,8
	19	42,8	11,2	23,0	28,5	36,8	42,8	40,4	12,2	22,1	27,6	35,9	40,4	36,4	13,2	20,7	26,2	34,5	36,4
	17	40,4	11,0	32,1	34,5	40,4	40,4	37,2	12,1	28,9	33,0	37,2	37,2	33,1	13,1	26,0	31,5	33,1	33,1
	15	36,4	10,9	33,9	36,4	36,4	36,4	34,7	11,8	33,1	34,7	34,7	34,7	31,1	12,9	31,1	31,1	31,1	31,1

* Data in accordance with Eurovent Rooftop program certification conditions

PT: Total Power; PC: Power absorbed by the compressor

WB: Wet-bulb temperature; TS: Dry bulb temperature.

1.12 ARH/ARD output

1.12.1 ARH/ARD 017 cooling capacities

Return air		Outdoor coil air temperature (TS)																	
Flow rate m^3/h	TH °C	27 °C						35 °C						46 °C					
		PT kW	PC kW	Sensible power kW				PT kW	PC kW	Sensible power kW				PT kW	PC kW	Sensible power kW			
				TS inlet temp. in indoor coil						TS inlet temp. in indoor coil						TS inlet temp. in indoor coil			
				22	24	27	30			22	24	27	30			22	24	27	30
(Minimum) 2800	23	20,8	4,6	–	7,2	9,9	12,8	19,8	5	–	6,8	9,6	12,4	17,8	5,5	–	6,2	9	11,8
	19	18,9	4,4	9,5	11,4	14,1	16,9	17,8	4,8	9,1	10,9	13,8	16,5	16	5,2	8,4	10,3	13,1	15,9
	17	17,8	4,3	11,8	13,4	16,2	17,8	16,4	4,8	11	12,8	15,5	16,4	14,6	5,1	10,2	12,1	14,6	14,6
	15	16	4,3	13,1	15	16	16	15,3	4,7	12,8	14,6	15,3	15,3	13,7	5,1	12,1	13,7	13,7	13,7
(Nominal) 3400	23	21,2	4,7	–	7,3	10,7	14,1	20,2	5,1	–	7	10,4	13,7	18,2	5,6	–	6,4	9,7	13,1
	19	19,3	4,5	10,1	12,3	15,7	19,1	18,2	4,9	9,6	11,9	15,3	18,2	16,4	5,3	9	11,2	14,6	16,4
	17	18,2	4,4	12,9	14,8	18,1	18,2	16,7	4,9	12,1	14,1	16,7	16,7	14,9	5,2	11,1	13,4	14,9	14,9
	15	16,4	4,4	14,5	16,4	16,4	16,4	15,6	4,8	14,1	15,6	15,6	15,6	14	5,2	13,5	14	14	14
(Maximum) 4000	23	21,5	4,8	–	7,5	11,4	15,4	20,4	5,3	–	7,1	11,1	15	18,4	5,9	–	6,6	10,5	14,4
	19	19,5	4,7	10,6	13,2	17,2	19,5	18,4	5,1	10,2	12,8	16,8	18,4	16,5	5,5	9,6	12,2	16,1	16,5
	17	18,4	4,6	14,2	16	18,4	18,4	16,9	5	13,1	15,4	16,9	16,9	15,1	5,5	12,1	14,8	15,1	15
	15	16,5	4,5	15,8	16,5	16,5	16,5	15,8	4,9	15,5	15,8	15,8	15,8	14,2	5,4	14,7	14,2	14,2	14,1

* Data in accordance with Eurovent Rooftop program certification conditions

PT: Total Power; PC: Power absorbed by the compressor

WB: Wet-bulb temperature; TS: Dry bulb temperature.

1.12.2 ARH/ARD 022 cooling capacities

Return air		Outdoor coil air temperature (TS)																	
Flow rate m^3/h	TH °C	27 °C						35 °C						46 °C					
		PT kW	PC kW	Sensible power kW				PT kW	PC kW	Sensible power kW				PT kW	PC kW	Sensible power kW			
				TS inlet temp. in indoor coil						TS inlet temp. in indoor coil						TS inlet temp. in indoor coil			
				22	24	27	30			22	24	27	30			22	24	27	30
(Minimum) 3500	23	25,4	5,9	–	8,8	12,2	15,7	24,1	6,4	–	8,3	11,8	15,2	21,7	7,1	–	7,6	11	14,5
	19	23	5,7	11,6	13,9	17,4	20,9	21,7	6,2	11,1	13,5	16,9	20,3	19,5	6,7	10,3	12,6	16,1	19,5
	17	21,7	5,6	14,7	16,5	19,9	21,7	20	6,1	13,6	15,7	19,1	20	17,8	6,6	12,5	14,8	17,8	17,8
	15	19,6	5,5	16,2	18,5	19,6	19,6	18,7	6	1,57	17,9	18,7	18,7	16,7	6,6	14,8	16,7	16,7	16,7
(Nominal) 4300	23	26	5,9	–	9	13,2	17,4	24,7	6,4	–	8,5	12,8	17	22,2	7,1	–	7,8	12	16,2
	19	23,5	5,7	12,4	15,2	19,4	23,5	22,2	6,2	11,9	14,7	18,9	22,2	20	6,7	11,1	13,9	18,1	20
	17	22,2	5,6	16,3	18,3	22,2	22,2	20,4	6,1	15	17,4	20,4	20,4	18,2	6,6	13,8	16,6	18,2	18,2
	15	20	5,5	17,9	20	20	20	19,1	6	17,4	19,1	19,1	19,1	17,1	6,6	16,6	17,1	17,1	17,1
(Maximum) 5100	23	26,8	6,1	–	9,2	14,1	19,1	25	6,7	–	8,7	13,7	18,7	22,5	7,4	–	8	13	17,9
	19	23,9	5,9	13,1	16,4	21,4	23,9	22,5	6,4	12,6	15,9	20,9	22,5	20,3	6,9	11,8	15,1	20,1	20,2
	17	22,5	5,8	18,1	20	22,5	22,5	20,7	6,3	16,5	19,2	20,7	20,7	18,5	6,8	15	18,3	18,5	18,5
	15	20,3	5,7	19,6	20,2	20,2	20,3	19,4	6,2	19,2	19,3	19,3	19,4	17,4	6,8	17,3	17,3	17,4	17,4

* Data in accordance with Eurovent Rooftop program certification conditions

PT: Total Power; PC: Power absorbed by the compressor

WB: Wet-bulb temperature; TS: Dry bulb temperature.

1.12.3 ARH/ARD 032 cooling capacities

Return air		Outdoor coil air temperature (TS)																	
		27 °C						35 °C						46 °C					
Flow rate m³/h	TH °C	PT kW	PC kW	Sensible power kW				PT kW	PC kW	Sensible power kW				PT kW	PC kW	Sensible power kW			
				TS inlet temp. in indoor coil						TS inlet temp. in indoor coil						TS inlet temp. in indoor coil			
				22	24	27	30			22	24	27	30			22	24	27	30
(Minimum) 4700	23	35,5	7,7	–	12,3	16,9	21,6	33,7	8,4	–	11,6	16,3	20,9	30,3	9,3	–	10,5	15,2	19,9
	19	32,1	7,5	16,1	19,3	23,9	28,6	30,3	8,1	15,4	18,5	23,2	27,8	27,3	8,7	14,3	17,4	22,0	26,7
	17	30,3	7,3	20,1	22,7	27,3	30,3	27,9	8,0	18,7	21,5	26,2	27,9	24,5	8,7	17,2	20,3	24,8	24,8
	15	27,3	7,2	22,2	25,3	27,3	27,3	26,1	7,9	21,5	24,6	26,1	26,1	23,3	8,6	20,4	23,3	23,3	23,3
(Nominal) 5700	23	36,2	7,8	–	12,5	18,1	23,7	34,4	8,5	–	11,9	17,5	23,1	31,0	9,4	–	10,8	16,4	22,1
	19	32,8	7,5	17,1	20,8	26,4	32,0	31,0	8,2	16,3	20,1	25,7	31,0	29,9	8,9	15,2	19,0	24,6	27,9
	17	31,0	7,4	22,2	24,9	30,5	31,0	28,5	8,1	20,5	23,7	28,5	28,5	25,4	8,8	18,8	22,5	25,4	25,4
	15	27,9	7,3	24,4	27,9	27,9	27,9	26,6	8,0	23,7	26,6	26,6	26,6	23,8	8,7	22,6	23,8	23,8	23,8
(Maximum) 6800	23	37,2	7,8	–	12,9	19,6	26,2	35,3	8,5	–	12,3	18,9	25,6	31,8	9,4	–	11,3	17,9	24,5
	19	33,7	7,5	18,2	22,6	29,3	33,7	31,8	8,2	17,5	21,9	28,5	31,8	28,6	8,9	16,4	20,8	27,5	28,6
	17	31,8	7,4	24,7	27,4	31,8	31,8	29,3	8,1	22,6	26,3	29,3	29,3	26,1	8,8	20,7	25,1	26,1	26,1
	15	28,6	7,3	26,9	28,6	28,6	28,6	27,4	8,0	26,3	27,4	27,4	27,4	24,5	8,7	24,5	24,5	24,5	24,5

* Data in accordance with Eurovent Rooftop program certification conditions

PT: Total Power; PC: Power absorbed by the compressor

WB: Wet-bulb temperature; TS: Dry bulb temperature.

1.12.4 ARH/ARD 040 cooling capacities

Return air		Outdoor coil air temperature (TS)																	
		27 °C						35 °C						46 °C					
Flow rate m³/h	TH °C	PT kW	PC kW	Sensible power kW				PT kW	PC kW	Sensible power kW				PT kW	PC kW	Sensible power kW			
				TS inlet temp. in indoor coil						TS inlet temp. in indoor coil						TS inlet temp. in indoor coil			
				22	24	27	30			22	24	27	30			22	24	27	30
(Minimum) 6200	23	44,8	11,4	–	15,4	21,5	27,6	42,5	12,5	–	14,6	20,7	26,8	38,3	13,8	–	13,3	19,4	25,5
	19	40,5	11,0	20,5	24,5	30,6	36,7	38,3	12,0	19,5	23,6	29,7	35,8	34,4	13,0	18,2	22,2	28,3	34,4
	17	38,3	10,8	26,3	28,9	35,0	38,3	35,2	11,9	24,2	27,5	33,6	35,2	31,4	12,8	22,0	26,0	31,4	31,4
	15	34,4	10,7	28,3	32,4	34,4	34,4	32,9	11,6	27,5	31,6	32,9	32,9	39,4	12,7	26,1	29,4	29,4	29,5
(Nominal) 7400	23	46,6	11,4	–	16,1	23,3	30,5	44,2	12,5	–	15,3	22,5	29,6	39,9	13,8	–	14,0	21,1	28,3
	19	42,2	11,0	21,9	26,7	33,9	41,1	39,9	12,0	21,0	25,8	33,0	39,9	35,9	13,0	16,6	24,4	31,6	35,9
	17	39,9	10,8	29,3	31,9	39,1	39,9	36,7	11,9	26,7	30,5	36,7	36,7	32,7	12,8	24,2	28,9	32,7	32,7
	15	35,9	10,7	31,3	35,9	35,9	35,9	34,3	11,6	30,5	34,3	34,3	34,3	30,7	12,7	29,0	30,7	30,7	30,7
(Maximum) 8600	23	47,3	11,6	–	16,4	24,7	32,9	44,9	12,7	–	15,6	23,9	31,1	40,4	14,0	–	14,3	22,6	30,8
	19	42,8	11,2	23,0	28,5	36,8	42,8	40,4	12,2	22,1	27,6	35,9	40,4	36,4	13,2	20,7	26,2	34,5	36,4
	17	40,4	11,0	32,1	34,5	40,4	40,4	37,2	12,1	28,9	33,0	37,2	37,2	33,1	13,1	26,0	31,5	33,1	33,1
	15	36,4	10,9	33,9	36,4	36,4	36,4	34,7	11,8	33,1	34,7	34,7	34,7	31,1	12,9	31,1	31,1	31,1	31,1

* Data in accordance with Eurovent Rooftop program certification conditions

PT: Total Power; PC: Power absorbed by the compressor

WB: Wet-bulb temperature; TS: Dry bulb temperature.

1.12.5 ARH/ARD 017 thermodynamic heat capacities

Flow rate m³/h	Return air TS °C	Outdoor air temperature TS °C															
		-10		-5		0		5		7		10		15		20	
		PT	PC	PT	PC	PT	PC	PT	PC	PT	PC	PT	PC	PT	PC	PT	PC
(Minimum) 2800	14	12,1	3,8	13,7	4,0	15,5	4,1	17,4	4,2	18,3	4,4	19,6	4,6	22,0	4,9	24,5	5,1
	17	11,9	4,1	13,5	4,3	15,3	4,5	17,2	4,6	18,1	4,8	19,4	5,0	21,7	5,3	24,2	5,5
	20	11,8	4,2	13,3	4,4	15,1	4,6	17,0	4,7	17,8	4,9	19,1	5,1	21,5	5,4	23,9	5,6
	23	11,6	4,5	13,2	4,7	14,9	4,9	16,8	5,0	17,6	5,2	18,9	5,4	21,2	5,8	23,6	6,0
	25	11,6	4,6	13,1	4,8	14,8	5,0	16,7	5,1	17,5	5,4	18,8	5,6	21,0	6,0	23,5	6,2
(Nominal) 3400	14	12,3	3,7	13,8	3,8	15,7	4,0	17,7	4,1	18,5	4,3	19,9	4,4	22,3	4,8	24,8	4,9
	17	12,1	4,0	13,7	4,2	15,5	4,3	17,5	4,4	18,3	4,6	19,6	4,8	22,0	5,2	24,5	5,3
	20	12,0	4,1	13,5	4,3	15,3	4,4	17,3	4,5	18,1	4,8	19,4	4,9	21,8	5,3	24,3	5,5
	23	11,8	4,4	13,3	4,5	15,1	4,8	17,0	4,9	17,9	5,1	19,2	5,3	21,5	5,6	23,9	5,8
	25	11,7	4,5	13,3	4,7	15,0	4,9	16,9	5,0	17,8	5,2	19,0	5,4	21,3	5,8	23,8	6,0
(Maximum) 4000	14	12,4	3,6	14,0	3,7	15,8	3,9	17,9	4,0	18,7	4,2	20,1	4,3	22,5	4,6	25,1	4,8
	17	12,2	3,9	13,8	4,0	15,7	4,2	17,6	4,3	18,5	4,5	19,8	4,7	22,2	5,0	24,8	5,2
	20	12,1	4,0	13,7	4,1	15,5	4,3	17,4	4,4	18,3	4,6	19,6	4,8	22,0	5,1	24,5	5,3
	23	11,9	4,3	13,5	4,4	15,3	4,6	17,2	4,7	18,0	5,0	19,3	5,1	21,7	5,5	24,2	5,7
	25	11,9	4,4	13,4	4,6	15,2	4,8	17,1	4,9	17,9	5,1	19,2	5,3	21,6	5,6	24,0	5,9

* Data in accordance with Eurovent Rooftop program certification conditions

PT: Total Power; PC: Power absorbed by the compressor

WB: Wet-bulb temperature; TS: Dry bulb temperature.

1.12.6 ARH/ARD 022 thermodynamic heat capacities

Flow rate m³/h	Return air TS °C	Outdoor air temperature TS °C															
		-10		-5		0		5		7		10		15		20	
		PT	PC	PT	PC	PT	PC	PT	PC	PT	PC	PT	PC	PT	PC	PT	PC
(Minimum) 3500	14	14,7	4,6	16,7	4,8	18,9	5,1	21,3	5,2	22,3	5,4	23,9	5,6	26,8	6,0	29,9	6,2
	17	14,6	5,0	16,5	5,2	18,7	5,5	21,0	5,6	22,1	5,9	23,6	6,1	26,5	6,5	29,5	6,7
	20	14,4	5,1	16,3	5,4	18,4	5,6	20,8	5,7	21,8	6,0	23,4	6,2	26,2	6,6	29,2	6,9
	23	14,2	5,5	16,1	5,7	18,2	6,0	20,5	6,1	21,5	6,4	23,1	6,6	25,9	7,1	28,8	7,4
	25	14,1	5,7	16,0	5,9	18,1	6,2	20,4	6,3	21,4	6,6	22,9	6,8	25,7	7,3	28,6	7,6
(Nominal) 4300	14	15,0	4,5	16,9	4,7	19,1	4,9	21,6	5,0	22,6	5,2	24,3	5,4	27,2	5,8	30,3	6,0
	17	14,8	4,9	16,7	5,1	18,9	5,3	21,3	5,4	22,4	5,7	24,0	5,9	26,9	6,3	30,0	6,5
	20	14,6	5,0	16,5	5,2	18,7	5,4	21,1	5,5	22,1	5,8	23,7	6,0	26,6	6,4	29,6	6,7
	23	14,4	5,3	16,3	5,6	18,5	5,8	20,8	5,9	21,8	6,2	23,4	6,4	26,2	6,9	29,2	7,1
	25	14,3	5,5	16,2	5,7	18,3	6,0	20,7	6,1	21,7	6,4	23,2	6,6	26,1	7,1	29,1	7,3
(Maximum) 5100	14	15,1	4,4	17,1	4,6	19,3	4,8	21,8	4,9	22,9	5,1	24,5	5,3	27,5	5,7	30,6	5,9
	17	14,9	4,8	16,9	4,9	19,1	5,2	21,5	5,3	22,6	5,5	24,2	5,7	27,2	6,1	30,3	6,4
	20	14,8	4,9	16,7	5,1	18,9	5,3	21,3	5,4	22,3	5,7	23,9	5,9	26,8	6,3	29,9	6,5
	23	14,6	5,2	16,5	5,4	18,6	5,7	21,0	5,8	22,0	6,1	23,6	6,3	26,5	6,7	29,5	7,0
	25	14,5	5,3	16,4	5,6	18,5	5,8	20,9	5,9	21,9	6,2	23,5	6,4	26,3	6,9	29,3	7,2

* Data in accordance with Eurovent Rooftop program certification conditions

PT: Total Power; PC: Power absorbed by the compressor

WB: Wet-bulb temperature; TS: Dry bulb temperature.

1.12.7 ARH/ARD 032 thermodynamic heat capacities

Flow rate m³/h	Return air TS °C	Outdoor air temperature TS °C															
		-10		-5		0		5		7		10		15		20	
		PT	PC	PT	PC	PT	PC	PT	PC	PT	PC	PT	PC	PT	PC	PT	PC
(Minimum) 4700	14	20,6	6,5	23,3	6,8	26,4	7,1	29,8	7,2	31,2	7,5	33,4	7,8	37,5	8,4	41,8	8,7
	17	20,4	7,0	23,0	7,3	26,1	7,6	29,4	7,8	30,8	8,2	33,1	8,5	37,1	9,1	41,3	9,4
	20	20,1	7,2	22,8	7,5	25,8	7,8	29,1	8,0	30,5	8,4	32,7	8,7	36,6	9,3	40,8	9,6
	23	19,9	7,7	22,5	8,0	25,4	8,4	28,7	8,5	30,1	8,9	32,2	9,3	36,1	9,9	40,3	10,3
	25	19,8	7,9	22,3	8,2	25,3	8,6	28,5	8,8	29,9	9,2	32,0	9,5	35,9	10,2	40,1	10,6
(Nominal) 5700	14	20,9	6,3	23,6	6,5	26,8	6,8	30,2	7,0	31,6	7,3	33,9	7,6	38,0	8,1	42,4	8,4
	17	20,7	6,8	23,4	7,1	26,5	7,4	29,8	7,6	31,3	7,9	33,5	8,2	37,6	8,8	41,9	9,1
	20	20,4	7,0	23,1	7,2	26,1	7,6	29,5	7,7	30,9	8,1	33,1	8,4	37,1	9,0	41,4	9,3
	23	20,2	7,5	22,8	7,8	25,8	8,1	29,1	8,3	30,5	8,7	32,7	9,0	36,7	9,6	40,9	10,0
	25	20,0	7,7	22,6	8,0	25,6	8,3	28,9	8,5	30,3	8,9	32,5	9,2	36,4	9,9	40,6	10,2
(Maximum) 6800	14	21,1	6,1	23,9	6,4	27,1	6,7	30,5	6,8	32,0	7,1	34,3	7,4	38,5	7,9	42,9	8,2
	17	20,9	6,6	23,6	6,9	26,7	7,2	30,2	7,4	31,6	7,7	33,9	8,0	38,0	8,6	42,4	8,9
	20	20,6	6,8	23,3	7,1	26,4	7,4	29,8	7,5	31,2	7,9	33,5	8,2	37,6	8,8	41,9	9,1
	23	20,4	7,3	23,0	7,6	26,1	7,9	29,4	8,1	30,8	8,4	33,1	8,7	37,1	9,4	41,3	9,7
	25	20,3	7,5	22,9	7,8	25,9	8,1	29,2	8,3	30,6	8,7	32,9	9,0	36,8	9,6	41,1	10,0

* Data in accordance with Eurovent Rooftop program certification conditions

PT: Total Power; PC: Power absorbed by the compressor

WB: Wet-bulb temperature; TS: Dry bulb temperature.

1.12.8 ARH/ARD 040 thermodynamic heating capacities

Flow rate m³/h	Return air TS °C	Outdoor air temperature TS °C															
		-10		-5		0		5		7		10		15		20	
		PT	PC	PT	PC	PT	PC	PT	PC	PT	PC	PT	PC	PT	PC	PT	PC
(Minimum) 6200	14	26,1	9,1	29,4	9,5	33,3	9,9	37,6	10,1	39,4	10,6	42,3	11,0	47,4	11,8	52,8	12,2
	17	25,7	9,9	29,1	10,3	33,0	10,7	37,2	11,0	39,0	11,5	41,8	11,9	46,8	12,7	52,2	13,2
	20	25,4	10,1	28,8	10,5	32,6	11,0	36,7	11,2	38,5	11,7	41,3	12,1	46,3	13,0	51,6	13,5
	23	25,1	10,8	28,4	11,2	32,1	11,7	36,2	12,0	38,0	12,6	40,7	13,0	45,7	13,9	50,9	14,4
	25	25,0	11,1	28,2	11,5	31,9	12,1	36,0	12,3	37,8	12,9	40,5	13,4	45,4	14,3	50,6	14,8
(Nominal) 7400	14	26,4	8,9	29,8	9,2	33,8	9,6	38,1	9,8	39,9	10,3	42,8	10,7	48,0	11,4	53,5	11,8
	17	26,1	9,6	29,5	10,0	33,4	10,4	37,7	10,6	39,5	11,1	42,3	11,5	47,4	12,4	52,9	12,8
	20	25,8	9,8	29,1	10,2	33,0	10,7	37,2	10,9	39,0	11,4	41,8	11,8	46,9	12,6	52,3	13,1
	23	25,4	10,5	28,8	10,9	32,6	11,4	36,7	11,6	38,5	12,2	41,3	12,6	46,3	13,5	51,6	14,0
	25	25,3	10,8	28,6	11,2	32,4	11,7	36,5	12,0	38,3	12,5	41,0	13,0	46,0	13,9	51,3	14,4
(Maximum) 8600	14	26,6	8,6	30,1	8,9	34,1	9,3	38,4	9,5	40,3	10,0	43,2	10,3	48,4	11,1	54,0	11,5
	17	26,3	9,3	29,7	9,7	33,7	10,1	38,0	10,3	39,8	10,8	42,7	11,2	47,9	12,0	53,4	12,4
	20	26,0	9,5	29,4	9,9	33,3	10,3	37,5	10,6	39,4	11,1	42,2	11,5	47,3	12,3	52,7	12,7
	23	25,7	10,2	29,0	10,6	32,9	11,1	37,1	11,3	38,8	11,8	41,6	12,3	46,7	13,1	52,0	13,6
	25	25,5	10,5	28,8	10,9	32,7	11,4	36,8	11,6	38,6	12,2	41,4	12,6	46,4	13,5	51,7	14,0

* Data in accordance with Eurovent Rooftop program certification conditions

PT: Total Power; PC: Power absorbed by the compressor

WB: Wet-bulb temperature; TS: Dry bulb temperature.

1.13 Indoor fan

- Centrifugal fan with backward-curved blades
- Motor with integrated EC technology
- Differential pressure probe.
- Motor protection rating IP54 and insulation class F.

The differential pressure probe compares the static pressures in the suction area and the fan opening, and the electronic control automatically sets the speed of rotation to the required rpm to precicely obtain the required supply air flow.

If the required supply air flow rate value is not specified when placing the order, the manufacturer sends the unit adjusted to the rated flow.

To change the air flow rate value on site, consult the corresponding instruction manual (N-40414).

1.13.1 Features table

Model	Fan		
	Diameter	Maximum power [kW]	Maximum rpm
017 / 022	400	1,85	2180
032 / 040	500	2,82	1780

CAUTION

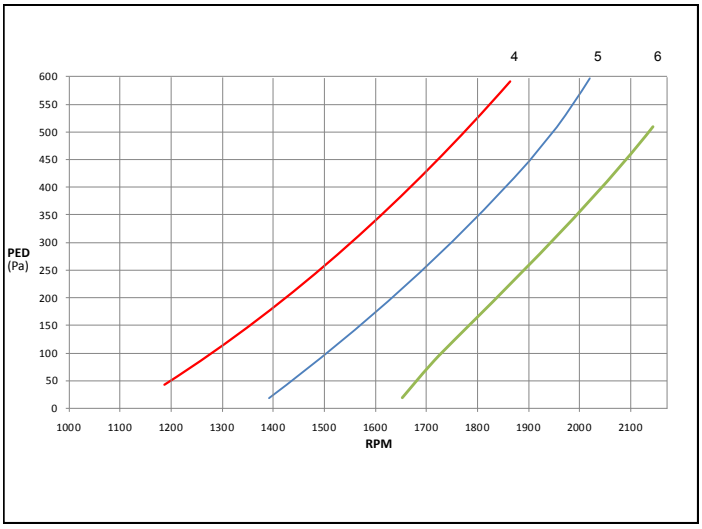
Before consulting the tables, add secure drops to the pressure required for the installation due to:

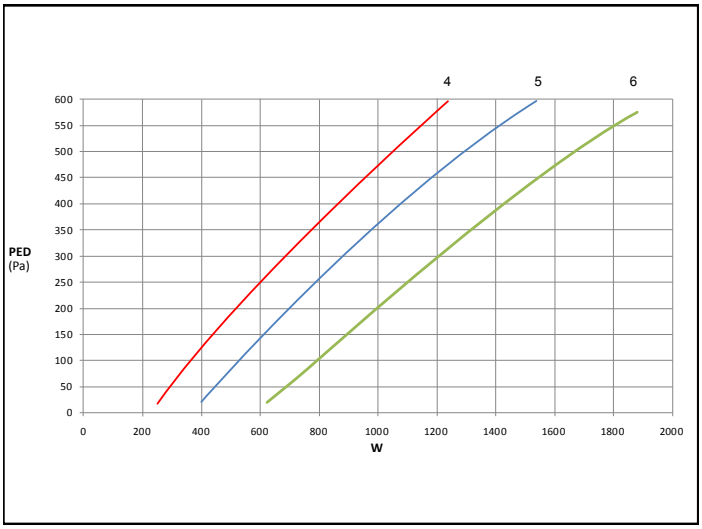
- *Gas heating (ARG/ARD Models)*
- *the side supply and*
- *accessories included in the unit, when appropriate. See Pressure drop of options/accessories, gas heating and horizontal ducts, see on page 33.*

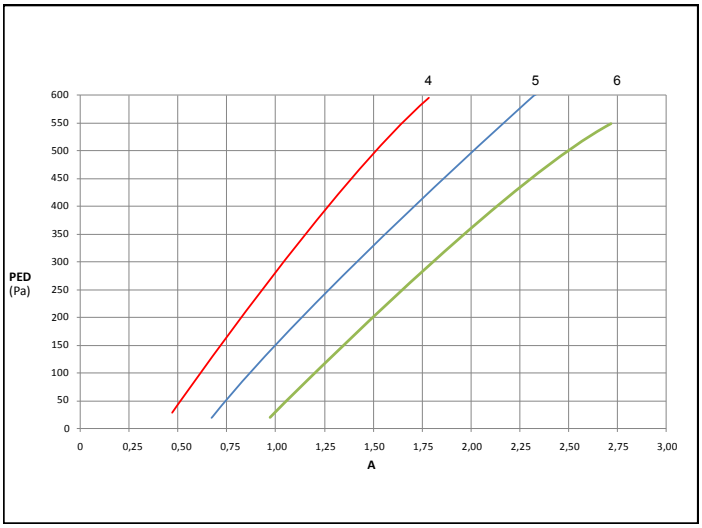
CAUTION

- *Before commissioning the installation, but after balancing the air distribution in the building, the supply air flow should be checked.*
- *With clean filters the indoor fan should not exceed a vacuum of -200 Pa in suction.*

1.13.2 Indoor fan charts, model AR-017 / 022

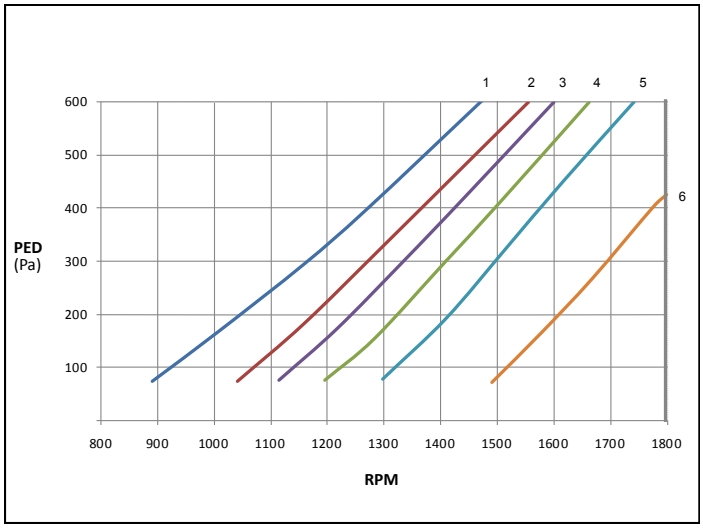


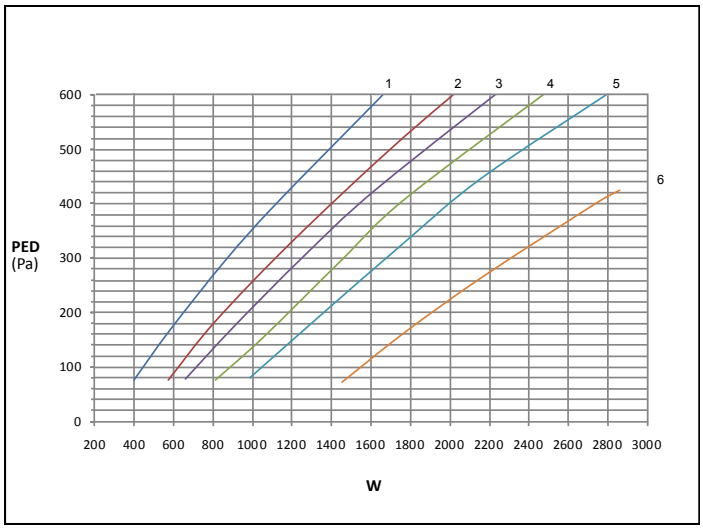


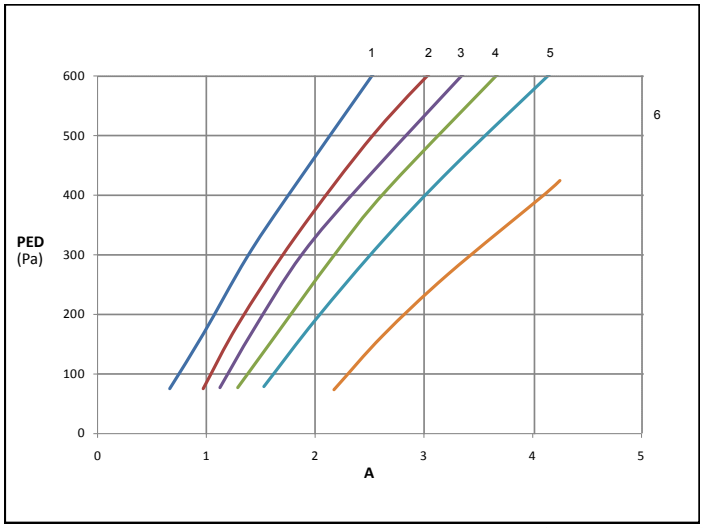


4	Minimum flow rate 3500 m^3/h	Model 022	SPA	Available static pressure (Pa)
5	Rated flow rate 4300 m^3/h	Model 022	RPM	Revolutions (revolutions per minute)
6	Maximum flow rate 5100 m^3/h	Model 022	W	Absorbed power (w)
			A	Current (A)

1.13.3 Indoor fan charts, model AR-032 / 040







1	Minimum flow rate 4700 m^3/h	Model 032	SPA	Available static pressure (Pa)
2	Rated flow rate 5700 m^3/h	Model 032	RPM	Revolutions (revolutions per minute)
3	Maximum flow rate 6,800 m^3/h	Model 032	W	Absorbed power (w)
4	Minimum flow rate 6200 m^3/h	Model 040	A	Current (A)
5	Rated flow rate 7400 m^3/h	Model 040		
6	Maximum flow rate 8,600 m^3/h	Model 040		

1.14 Pressure drop of options/accessories, gas heating and horizontal ducts

Model			m^3/h	Pressure drop (Pa)											
				017 / 022						032 / 040					
				2800	3400	3500	4000	4300	5100	4700	5700	6200	6800	7400	8600
Gas heating			ARG/ARD	15	17	18	20	22	25	17	20	22	23	25	30
Horizontal supply				12	15	16	18	20	24	15	20	22	24	26	30
Option or accessory	Economiser/Motorised damper			5	7	7	8	10	12	7	10	12	15	17	20
	Heating element kW		16	8	10	10	11	12	15	8	9	10	11	12	14
			25	10	12	13	14	16	20	9	11	12	13	14	16
			37	–	–	–	–	–	–	10	12	13	14	16	20
	Water coil			20	27	29	35	40	52	20	25	30	33	38	48
	Air filters F6			32	38	40	43	48	55	43	52	55	60	65	75
	Air filters F7			42	52	55	60	67	73	60	70	74	80	90	100

1.15 Instructions for installation and connection of the unit

1.15.1 Characteristics of the location

The location of the unit must be studied to ensure a completely satisfactory installation. To do so, the environmental conditions of the area where the unit is to be installed must be taken into account.

Furthermore, the normal weather conditions should be instrumental in determining the best position of the unit and the hoods, screens or covers required to ensure its correct working order.

If possible, in warm zones like the southern Europe, the unit should be located on the north or east side of the building or property.

The location chosen for the unit must provide the condenser with an unlimited air supply.

As well as the technical data given in this document and any others that are applicable, please bear in mind that the unit has been designed for outdoors installation only.

Where the unit is to be installed at ground level, refer to section *Specifications for the foundation or anchoring of the unit, see on page 34*.

Where the unit is to be installed on the roof of a building or property, make sure that the roof structure can support the weight of the unit plus that of any optional equipment and/or accessories to be fitted.

The unit must be installed on a specific mounting base or on a frame of appropriate steel angles. There are optional mounting bases available (RoofCurb).

Regardless, keep the level tolerance at maximum 10 mm all along the length and width of the unit.

If the unit is to be installed on a base or on a special angle frame that is not the standard RoofCurb, gaskets should be applied to all surfaces that are touching the bottom of the unit.

If it is preferred to place the unit on shock absorbers, this should be done as described in *Installation on shock absorbers, see on page 35*.

Special instructions for locations where there is regular snowfall or with ambient temperatures of close to 0 °C or less

In areas where there is regular or sporadic snow, the unit should be elevated above the ground or roof where it is installed. The height should be enough to prevent the unit, the condenser and evaporator air inlets and the access to the unit panels from becoming blocked by accumulated snow.

Protection against ice

In areas where the temperature can drop below 0 °C, there must be some kind of additional protection to prevent the water in the condensate drain pipe from freezing.

Use a wire heating element in the drain trap as well as in the drain, where applicable.

In heat pumps, also use wire heating elements in the outdoor coil tray to prevent any ice from accumulating.

Special instruction for locations with high ambient temperatures

In areas where the ambient temperature is over 43 °C, the unit must not be located in direct sunlight and, therefore a specific cover will be required.

The installation of a special sunshade over the unit must not affect the air flow required by the unit to work correctly. Check the minimum clearance required *General measurements and accesses, see on page 20*.

1.15.2 Characteristics of the facility where the unit will be installed

The air duct installation where the unit is to be installed must be formed by a closed return duct system. The additional installation of economisers or outdoor air intakes is not excluded.

To reduce operating noise, the supply and return air duct connections on the unit must be made using flexible joints.

The supply and return air duct systems must be designed for the air flow requirements of the installation. The ducts should not be sized based on the supply and return air connection sizes of the unit.

Duct covers

Units are shipped with side and lower duct openings covered. See section *Dimensions of the duct connections, see on page 16* and *Connections for supply and return ducts, see on page 18*.

1.15.3 Specifications for the foundation or anchoring of the unit

Where the unit is to be installed at ground level, the characteristics of the ground it will sit on must be taken into account.

Characteristics, such as acceptable surface firmness, must be suitable for the foundation the unit requires.

The unit should be placed on a level concrete slab at least 100 mm thick.

The length and width of the slab must be at least 150 mm more than the base rails on the unit.

⚠ CAUTION

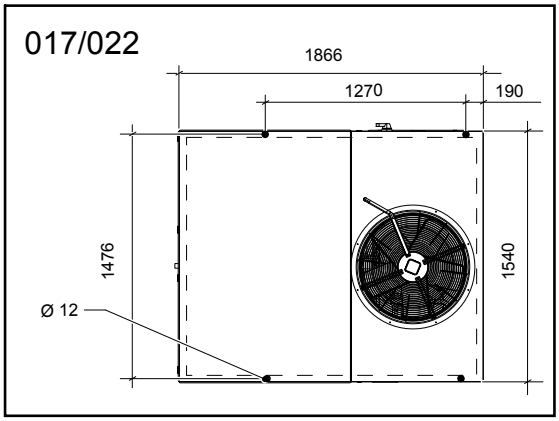
Do not attach the unit to the foundations of the building.

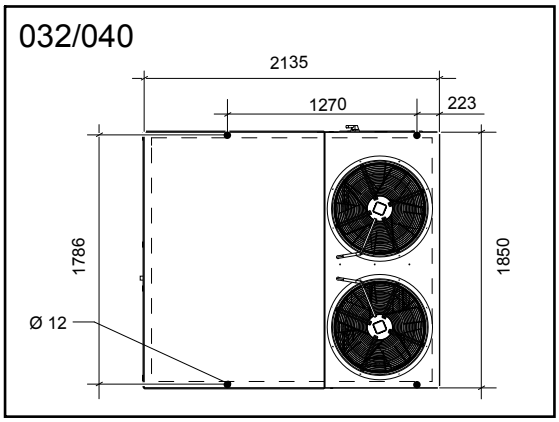
1.15.4 Installation on shock absorbers

The beams on the base of the unit have drill holes in order to mount shock absorber supports, distributed according to the figure.

The kit is supplied with the four shock absorbers and the necessary bolts for mounting, for the installation of the unit in its location.

The support points have been studied in order to achieve an equal distribution of weight in each shock absorber. With this weight distribution and type of shock absorber a 91% insulation level is achieved, according to the measurements taken in vibration testing.





	Approximate weight on each support point [kg] (units without options or accessories)			
Model	**017**	**022**	**032**	**040**
ARC	105	110	146	147
ARH	107	112	148	150
ARG	116	120	160	162
ARD	118	122	162	165

1.15.5 Characteristics of utility provider connections

In general, the different connections required by the unit are made following the shortest route possible. Under no circumstances may any local or national regulations be contravened when performing the preparatory work for service connections.

NOTE

For further information on this subject, always keep the current regulations for the country where the unit is being installed at hand.

CAUTION

- *Before the connection work, possible losses of flow, temperature and voltage drops, etc. that might affect the distances between planned connection points and the unit must be taken into account.*
- *As a result, each connection must be sized accordingly.*

Additional specifications for the gas connection (for ARG/ARD models only)

To correctly size the gas supply pipe, keep in mind the flow required, the specific density of the gas and the length of the stretch.

The fact that the heating value of the gas can vary from town to town should also be kept in mind. The heating value of the gas should be checked with the utility company.

1.15.6 Connection and preparation of the various connections

Gas (models ARG/ARD)

A specific line should be used for gas supply. Its installation must comply with country and local safety regulations.

NOTE

For further information on this subject, always keep the current regulations for the country where the unit is being installed at hand.

Access for the gas supply pipe connection

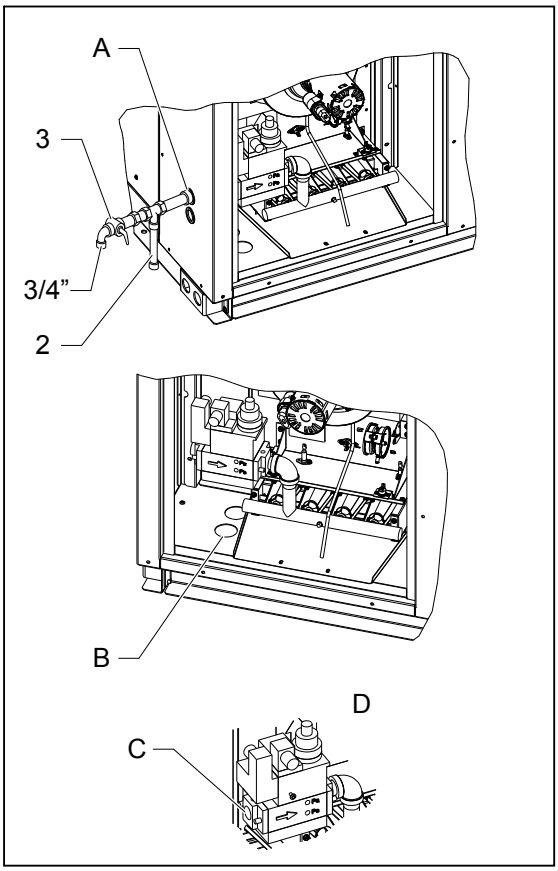
The access for the connection of the gas supply pipe can be done in two ways:

-A- On the side of the unit, via an access hatch situated in the corner.

-B- On the lower part of the unit, via an access hatch situated in the base.

In both cases, there is a blind rubber bushing covering the hole. Perforate the rear part of the bushing and existing insulator membrane in order to pass the supply pipe towards the inside of the unit.

Connection to the gas valve **-D-** is with thread R3/4" (3/4"BSP) **-C-**.



Important recommendations for the installation of the gas supply pipe

1. If the supply line needs to carry gas when there is condensation, then a device for its collection and discharge should be installed **-2-**.
2. Install a manual gas supply shut-off valve **-3-** if required by the current regulations in the country the unit is being installed in.
3. Install a ground in the gas supply line.
4. Use a wrought iron or steel pipe for the installation of the gas supply line.
5. Before installing the pipe hit the outside with a hammer to get rid of any dirt or scale it might have inside. Use compressed air to expel any residue and particles that might be there.

6. Apply a moderate amount of sealing paste to the threads of the male part of the joint.

DANGER

- *Natural gas may contain a small quantity of propane, which is an efficient solvent of lead carbonate and most common commercial compounds.*
- *In installations involving wrought iron or steel, a specialised putty should be used to seal them.*
- *Sealing material that complies with the BS6956 standards, part 5 or equivalent may be used.*

7. Purge the air from the gas supply line before using it.
8. Open the unit's main gas supply valve.
9. Apply a soapy water solution to all joints to test for any leaks.

DANGER

- *DANGER OF EXPLOSION. Never use a flame to verify the absence of leaks in the installation joints.*
- *During gas supply line pressure tests with pressures greater than 0,5 PSI (3,5 kPa), the burner and its manual shut-off valve must be disconnected from the system of gas supply pipes.*

Gas. Modification for service with LPG (Liquefied Petroleum Gas, propane gas)

All units with gas heating are specially manufactured to operate with natural gas. The unit can be modified to operate with LPG (Liquefied Petroleum Gas, propane gas) if necessary. This involves a conversion kit that is assembled during the installation work.

A specific line should be used for gas supply. Its installation must comply with country and local safety regulations.

The LPG propane pressure must be at 37 mbar with the unit at full load for it to operate correctly.

Three main factors must be taken into consideration in order to keep the gas pressure values correct:

1. Speed of gas evaporation, which depends on:
   a. the temperature of the liquid and
   b. the size of the "wet surface" of the container or containers.
2. Correct pressure regulation.
3. Pressure drop in the supply lines between the regulators and the unit. The diameter of the pipe depends on its length and the total load of all units.

NOTE

LPG propane gas tank and component manufacturers, as well as their suppliers, can provide complete information about the sizing of the tank in regards to evaporation, pipes, and recommended regulator adjustments.

Important recommendations for the installation of the gas supply pipe: *Gas (models ARG/ARD), see on page 36*.

Electricity. Power and control

POWER LINE

Power must be supplied to the unit through a specific power supply line with an exclusive power control and differential breaker, installed in line with national and local regulations.

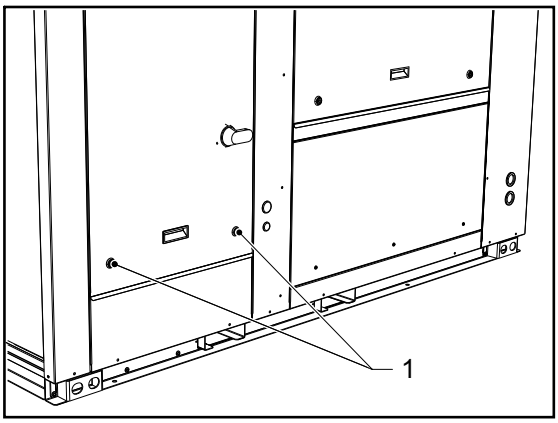
NOTE

For further information on this subject, always keep the current regulations for the country where the unit is being installed at hand.

Make sure that the electricity supply line has enough capacity to power the unit. Its length, the cable diameter and their protection (cover or jacket) should be appropriate for the unit.

Use a multimeter to check that the supply voltage stays within the accepted limits. *Technical and physical data for ARC (only cooling) and ARG (only cooling + gas heating), see on page 7* or *ARH technical and physical data (heat pump) and ARD (heat pump + gas heating), see on page 8*.

To install the power cable, loosen the closures **-1-** by 1/4 turn and remove the electrical board panel.

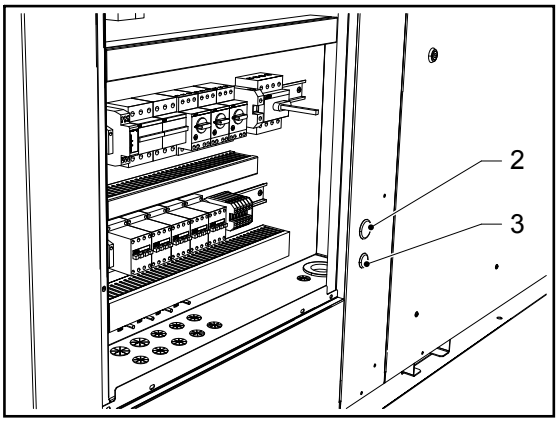


Bringing the power and control cables through the side of the unit.

The passages for both side wirings are sealed with a cap for the power cable **-2-** and for the control cable **-3-**.

Remove the wiring caps and instead attach packing glands of a suitable size for the cables.

Once the cables have been passed, seal the packing glands with silicone in order to ensure they are air tight.



Bringing the power and control cables directly from the Roofcurb

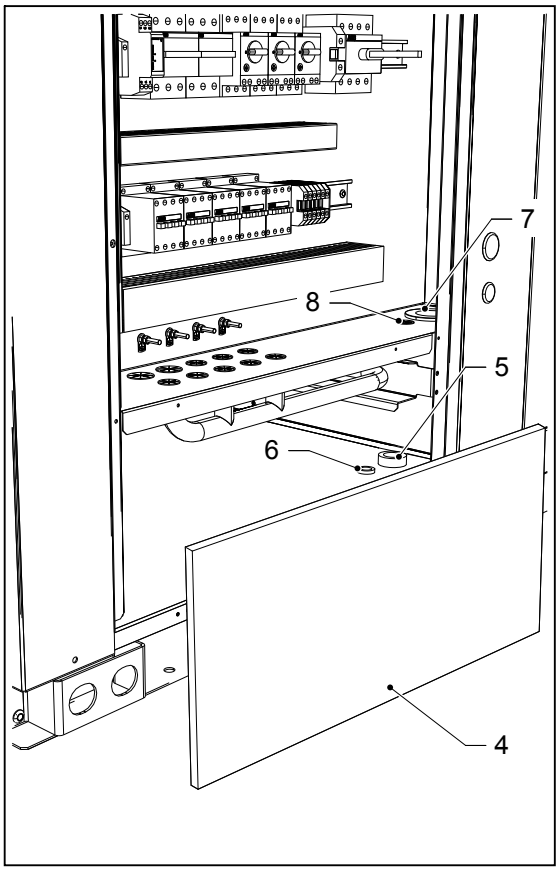
Remove the lower panel **-4-**.

The unit base beneath the electrical box has PG29 packing glands **-5-** (for the power cable) and PG16 packing glands **-6-** (for the control cable).

Pass the cables through them and to the inside of the electrical box for steps **-7-** and **-8-**.

Once the cables have been passed, seal the packing glands with silicone in order to ensure they are air tight.

Reattach the panels that were removed, ensuring that they are hermetically sealed.

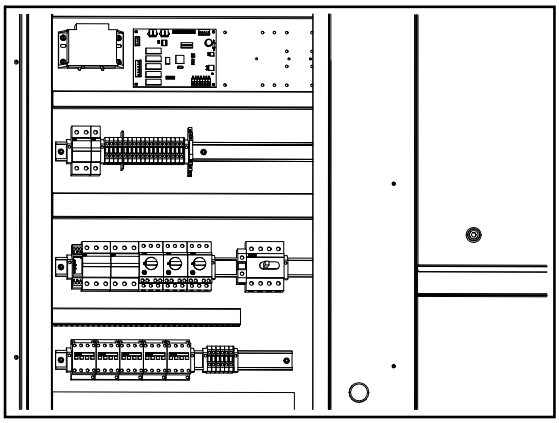


CONTROL LINE

Connect the cable to the terminals indicated and firmly tighten the securing bolts. Also consult the Wiring Diagrams.

NOTE

The complete wiring diagram for the unit is attached to the inside of the electrical panel.

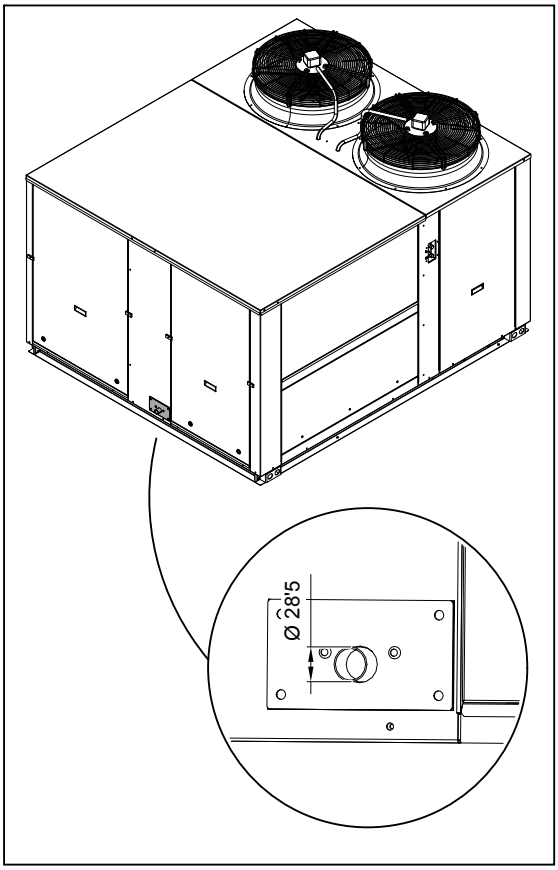


Indoor coil condensate drain

ATTENTION

The installation of pipes should be adjusted to local regulations.

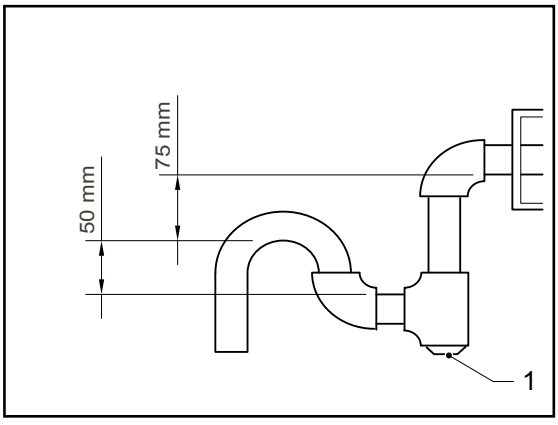
Install a condensate drain line from the unit connection to a nearby drain.



Apply a moderate amount of sealing paste to the threads of the male part of the joint.

The drain line must have a siphon in order to facilitate proper drainage.

If it is not a siphon made of flexible material, it is recommended that it has a stopper **-1-** for its drainage and cleaning.



NOTE

The condensate drain pipe should be at a minimum gradient of 2% (2 cm of drop for each metre in length).

Protection against ice

In areas where the temperature can reach 0 °C or less, there should be some kind of additional protection to prevent the water contained in the condensate drain pipe from freezing.

An heating element (wire heater) should be installed in the drain trap and in the condensate drain pipe.

For units with heat pumps, heating elements must also be installed in the outdoor coil tray to prevent possible ice accumulation.

1.16 Instructions for starting up the unit

1.16.1 Electrical checks

DANGER

- *All side panels of the unit must be fitted, closed and secured with their corresponding locks before turning the general switch on the unit.*
- *The unit has a remote control, which means that the fan turbine may start unexpectedly.*

CAUTION

Loose connection terminals produce overheating of cables and terminals. The unit will work incorrectly and there is a risk of fire.

Check that the cables are firmly secured to their connection terminals.

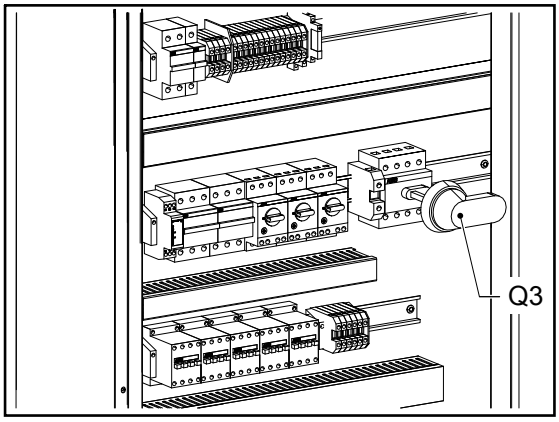
CAUTION

Do not turn on the general switch on the unit or start the unit until all installation work has been completed.

Initial connection of the unit

The general switch on the unit **-Q3-** must be turned on once all of the planned accessories are installed and before starting the unit.

Press the "Test" button for two seconds so that the unit recognises the installed accessories. When the recognition process is complete, the red pilot light switches off.



Rotating direction of the Scroll compressors

The scroll compressors and the fans only operate correctly if they rotate in the correct direction. All of the motors and compressors in the unit are connected so that they rotate correctly.

If the compressors are not connected correctly and are rotating in the wrong direction:

- The compressor will not compress.
- Operating noise will be abnormal.
- Electricity consumption (A) will be low.
- They overheat.

1.16.2 Starting the gas heating, ARG/ARD

DANGER

- *In order to prevent damage to the gas valve, the burner group should be disconnected from the gas pipe system during the pressure test.*
- *Only an Authorised Technical Assistance Service for Johnson Controls Inc. with the appropriate technical resources and adequately trained personnel may perform the start-up tasks for gas heating on the unit.*

Prior checks

1. Check that the type of gas to be used is the same as that specified on the ticket situated on the access panel to the gas section.

2. Check that the combustion air inlet as well as the outlet for gases are free of any obstacles or obstructions.
3. Make sure the gas supply line complies with safety regulations, that it is able to supply an adequate flow and pressure of gas, and that it has been purged of air.

On

The burner is equipped with an automatic lighting system.

DANGER

Do not try to start the burner manually.

Start up without the portable YKTOOL test device (accessory)

1. Connect the electrical supply to the unit.

2. Open the unit's gas supply valve.

3. Place the ambient thermostat in the maximum heat.

4. The burner group should light (it might take a few minutes depending on the mode established in the thermostat)

Post start-up checks

Once the entire control circuit is activated and the heating section is operating, the following checks should be made:

1. Make sure there are no gas leaks either in the unit's pipes or in the supply pipes.

DANGER

Never use a flame to verify the absence of leaks in the installation joints. DANGER OF EXPLOSION.

2. Check that the pressure of the supply gas is within the limits designated on the rating plate.

3. The supply pressure at full output should be checked for all gas appliances in the building.

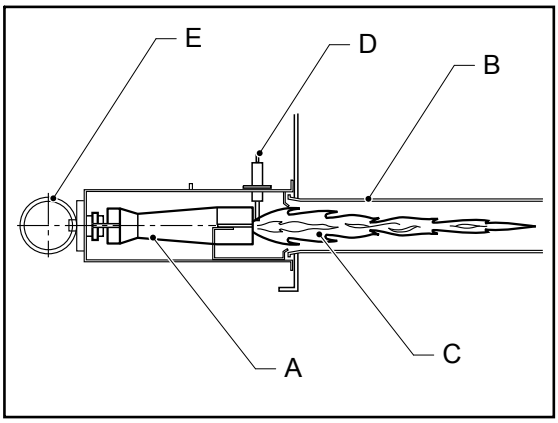
4. Pressure in the gas supply line should never exceed 25 mbar. In units powered by natural gas, the operating pressure should never fall below 12,5 mbar.

NOTE

If the gas supply is outside these limits, contact the gas utility company or your local representative for corrective measures.

5. Check that gas pressure in the manifold is correct. See *Gas valve/thermal switch adjustment, see on page 43*.

6. Check that the flame in the burners is blue.



A. Burner
B. Heat exchanger tube
C. Burner flame
D. Ignition electrode
E. Supply manifold

7. After 15 minutes of operation, and using a gas combustion analyser, check the CO, CO_2 and Nox content if possible, in the smoke duct outlet. With both stages of heat operating, the carbon monoxide (CO) content should be less than 0,1 % (1000 ppm). The CO/CO2 ratio should be less than 0,02.

Gas valve/thermal switch adjustment

ARG/ARD unit	Heat capacity [kW]		Gas family	Adjust gas valves [mbar]			Thermal breaker limits [°C]	
	Total (LHV)*	Net		Main regulator	Regulator 2nd stage	Regulator 1st stage	Automatic reset	Manual reset
017 / 022	25,6	23	2ND-H (G20)	10,5	9	4,5	82	93
032 / 040	45,6	41						

(LHV)*: Lower heating value.

For 3rd family gases (G31 Propane) the corresponding conversion kit must be installed, adjusting the gas pressures according to the instructions of the kit.

Gas pressure regulation in the burner supply manifold

ATTENTION

The units are shipped from factory tested and regulated for the 2ND-H(G20) natural gas family.

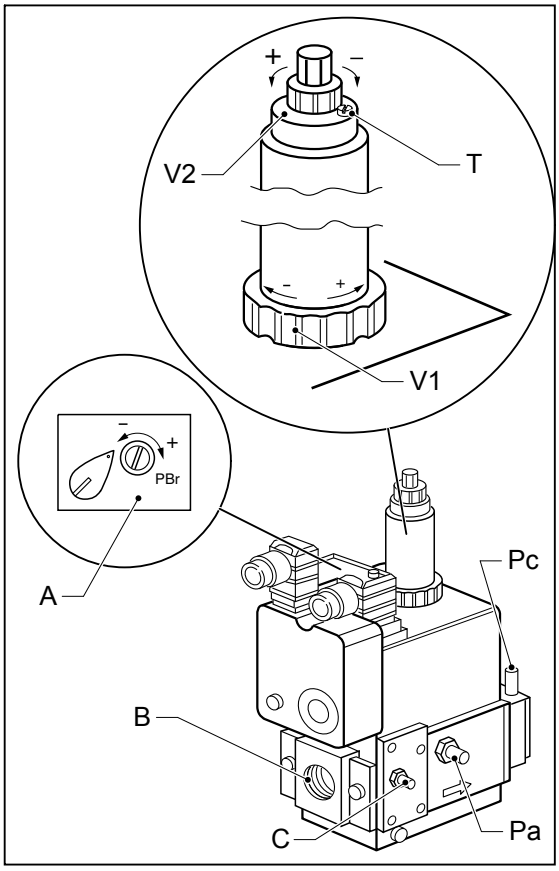
In case of a need to regulate gas pressure in the burner supply manifold:

1. With both stages of heat operating:
   - Adjust the main regulator (pressure reading **-Pa-**).
   - Adjust the 2nd stage regulator **-V2-** (pressure reading **-Pc-**).
2. With only heat stage no. 1 operating:
   - Adjust the 1st stage regulator **-V1-** (pressure reading **-Pc-**).
3. Once adjusted, tighten the securing bolt **-T-** of the regulating wheels.
4. Put the unit into operation with both stages of heat for a minimum of 15 minutes, and check the CO and CO_2 content according to the burner flame check in Section *Post start-up checks, see on page 42*.

A. Main regulator adjustment

B. Connection flange

C. Spigot for reading inlet pressure



Gas consumption

Based on natural gas 2ND-H, G20, at 20 mbar and 15 °C.

ARG/ARD model	Heat stages	Gas consumption m^3/h
017 / 022	100%	2,5
	50%	1,5
032 / 040	100%	4,5
	50%	2,7

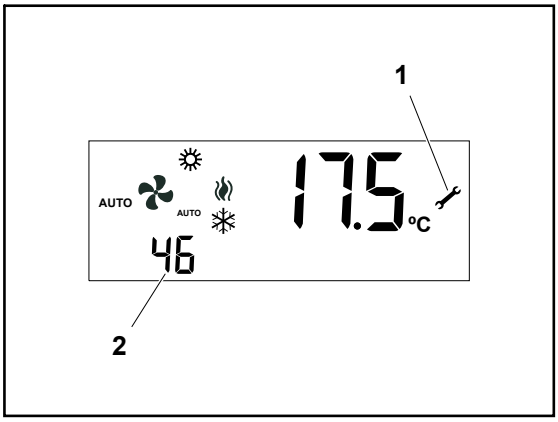
1.17 Unblocking the unit safely in case of breakdown

DANGER

- *All side panels except for that of the electrical box, must be fitted, closed and secured with their corresponding locks before turning the general switch on the unit.*
- *The unit has a remote control, which means that the fan turbine may start unexpectedly.*

To unlock the unit, see "Restarting the HVAC unit in case of fault" in the User Manual.

If the thermostat display keeps showing the pilot light **-1-** and any fault code or if the HVAC unit does not start, contact a Johnson Controls Inc. Authorised Technical Assistance Service.



1.18 Regular maintenance tasks performed by specialised personnel

Like any other machine, the unit requires regular maintenance, as the wear to which some of its parts are subjected can affect its mechanical reliability, electrical consumption and working life.

In order to keep the unit in similar working order to when it was installed and commissioned, a series of maintenance tasks must be performed every so often.

Furthermore, all maintenance and servicing tasks required by local and national regulations must be carried out.

DANGER

Only a Johnson Controls Inc. Authorised Technical Assistance Service with the appropriate technical resources and suitably trained personnel may perform the unit maintenance tasks.

CAUTION

Johnson Controls Inc. shall not be considered responsible for any damage caused by inappropriate use or maintenance of the unit that is in any way inconsistent with that described in this document or others specifically provided with the platform.

1.18.1 Planned Maintenance Schedule

The following table shows the recommended frequency for regular maintenance tasks. Depending on the environmental and working conditions where the unit is installed, maintenance tasks may be carried out more or less frequently. The units must undergo all planned maintenance, without exception.

The person responsible for the building or property where the unit is installed must ensure that these inspections are performed at the appropriate time. Likewise, this person should keep and maintain a log book reflecting both planned and unplanned work by the Johnson Controls Inc. Authorised Technical Assistance Service.

Task	Frequency			
	1 month	2 months	6 months	Annual
Indoor fan, see on page 45			X	
Air filters, see on page 45	X			
Indoor coil, see on page 45		X		
Condensate tray and drain trap, see on page 46		X		
Outdoor coil, see on page 46		X		
Cooling circuit, see on page 46			X	
Electrical and mechanical operation, see on page 46			X	
Condition of the unit structure and components, see on page 47				X
Hot water coil (accessory), see on page 47				X
Gas heating (ARG/ARD Models), see on page 47				X

1.18.2 Maintenance tasks performed by specialised personnel

DANGER

- ***The unit has a remote control, which means that the fan turbine may start unexpectedly.***
- ***Disconnect the general switch on the unit before removing any of its side panels.***

Indoor fan

Check the condition of the silicone pipes for the fan suction and the differential pressure probe.

Air filters

The air filters should be replaced by new ones of the same type and size, as required.

Slide the unit filters out on their guides to replace them.

NOTE

If the unit has an energy recovery system (accessory), it is important to follow the planned maintenance frequency for air filters.

Indoor coil

Visually inspect the indoor coil when performing air filter maintenance.

The complete surface of the fins must be kept clean. If they need to be cleaned, use a soft brush or a vacuum cleaner, taking special care not to damage the fins.

DANGER

Never use a water hose to clean the indoor coil compartment.

Condensate tray and drain trap

Loosen the four bolts **-1-** and extract away from the tray **-2-**.

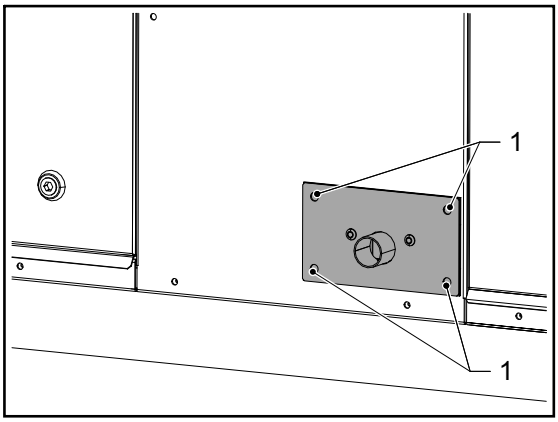
Remove all dirt and residue accumulated in the condensate tray.

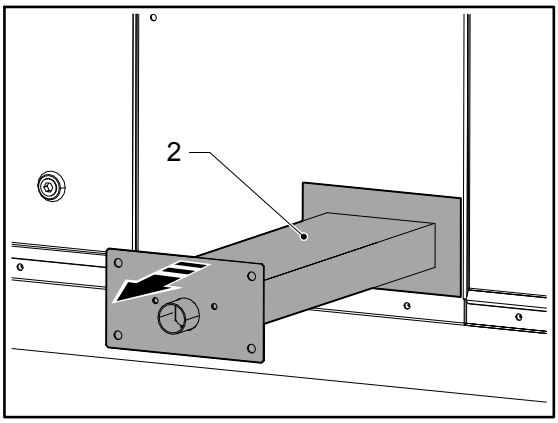
Check that neither the condensation outlet nor the drain trap is blocked.

Check that the condensate (water) has been correctly released to the outside.

Fill the drain trap with water if required (prime it).

Ensure that the four bolts are sealed hermetically **-1-**.





Outdoor coil

The complete surface of the fins must be kept clean. If they need to be cleaned, use a soft brush or a vacuum cleaner, taking special care not to damage the fins.

Given that they are exposed to the outdoors, the fins can accumulate a lot of dirt and grime (dust, soot, sand, etc.). To clean the fins more thoroughly, use water with a neutral detergent (e.g. washing-up liquid). Clean from the inside out and from top to bottom.

Cooling circuit

Before the start of each season when the unit is in use, a thorough check of the cooling circuit must be made, including operating pressures, controls and temperature rises, etc.

Electrical and mechanical operation

Before the start of each season when the unit is in use, check the consumption (in amps) of all motors, the condition of the electrical connections and the correct working order of the safety and protection systems.

The motor bearings for both the indoor and outdoor fans are permanently lubricated and do not need additional lubricant during maintenance.

If the unit has an economiser, motorised damper or barometric relief damper (accessory):

Check that the air dampers and their drive motors work correctly.

If the unit has an exhaust fan (accessory):

Check the condition of the fan and the operating control.

Condition of the unit structure and components

Check the correct condition of the unit structure and outdoor components for knocks, dents, scratched paint or rust. Check that bolts are properly secured and the condition of leak-proof seals and panel locks and make sure they close properly.

Hot water coil (accessory)

Before the start of each season of operation of the unit, check the level of water in the system, that air has been purged from the coils, and the operation of control components.

Depending on the climate where the unit is installed, the mix of antifreeze and water must be checked.

1.18.3 Gas heating (ARG/ARD Models)

Gas valve filter

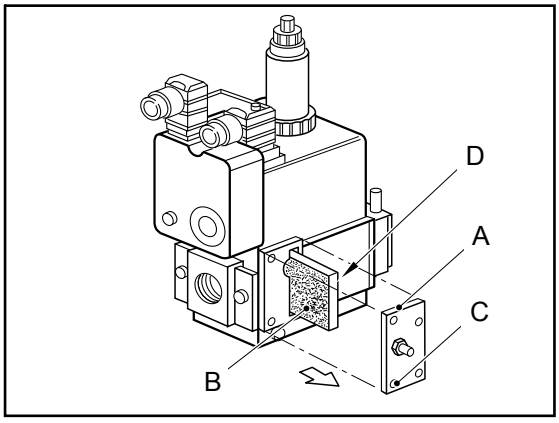
DANGER

Close the unit's gas supply valve before accessing the valve filter.

The gas filter **-B-** of the valve is located under a cover **-A-**, on the side face of the valve.

Check the condition of the gas filter in both valves. Clean and replace it if necessary.

In order to mount the filter, place it in the appropriate position **-D-** (side with metallic mesh) and attach the cover, tightening the four securing bolts **-C-** correctly and uniformly in order to ensure they are air tight.



Burners

Check how the flame in the burners looks.

If it does not look right, the burners may need cleaning. To do so, remove the burner group as specified in *Instructions for burner and injector inspection, see on page 47*.

Gas injectors

Visually check that the injector calibrated holes are not partially obstructed. Clean them if necessary as described in *Instructions for burner and injector inspection, see on page 47*.

Combustion air inlet

Check that the combustion air inlet is free of obstruction from dirt, snow, branches, dry leaves, residue or other objects.

Discharge of combustion gases

Check that the combustion gasses discharge is free of obstruction from dirt, snow, branches, dry leaves, residue or other objects.

Check that there is no accumulation of soot on the panel around the exhaust tubes. If there is soot accumulated, it could be that combustion is incomplete. If that is the case, make the checks indicated in *Post start-up checks, see on page 42*.

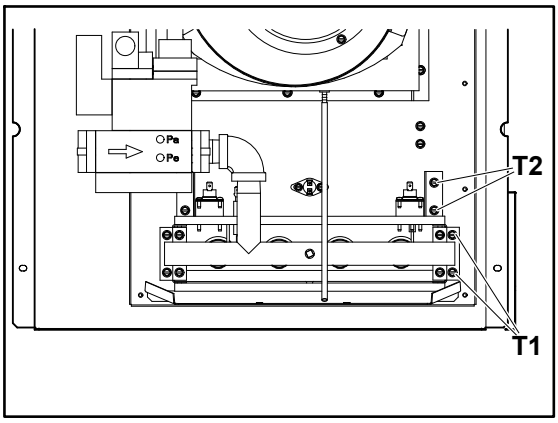
Instructions for burner and injector inspection

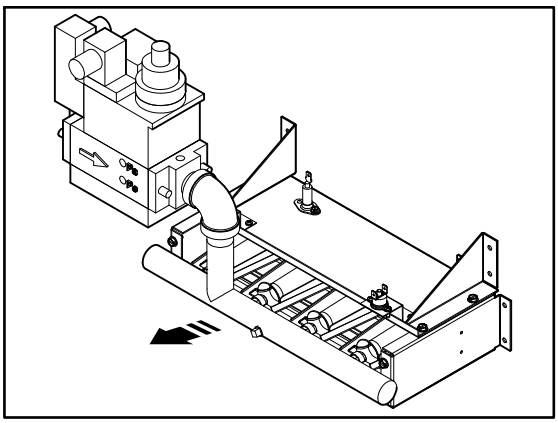
ATTENTION

Before starting these operations, the gas supply flow valve must be closed and the power supply to the unit switched off.

1. Remove the access panel to the gas section.
2. Disconnect the gas supply pipe from the unit.
3. Disconnect the cables from the gas valve, ignition electrode and flame and temperature sensors.
4. Loosen the bolts securing the assembly formed by the gas valve, the manifold and the burner coil to the section base panel.
5. Remove the four bolts from the bottom **-T1-**.
6. Remove the four bolts from the top **-T2-**.
7. Remove the assembly outwards, taking care not to pull any cable or silicone pipe connected to the bottom of the flue box.

   NOTE
   The burners and injectors can now be accessed for inspection and cleaning.
8. Proceed in reverse order to refit the assembly.



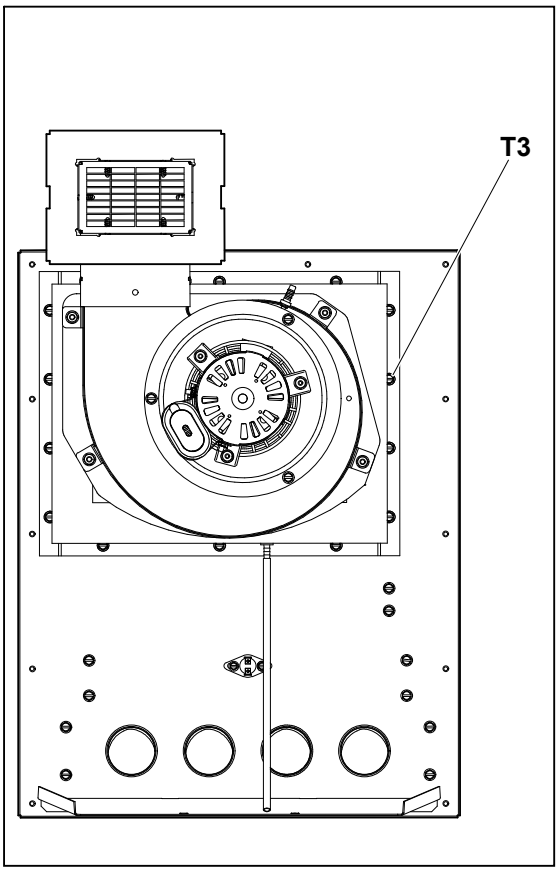


Heat exchanger cleaning

The heat exchanger pipes rarely need cleaning if combustion is adjusted appropriately. In the event of accumulated soot, they can be cleaned as follows:

1. Remove the assembly formed by the gas valve, the manifold and the burner coil, according to the procedure in Section *Instructions for burner and injector inspection, see on page 47*. This exposes the start of the exchanger pipes.

   CAUTION
   Be particularly careful not to damage the seal (high-temperature strip) that ensures the sealing of the flue box with the panel.
2. Remove the flue box assembly (which includes the fan and the exhaust duct) by loosening the bolts **-T3-**. This exposes the end of the exchanger pipes and the inside of the flue box.
3. Brush and sweep out the interior of each of the pipes, getting to the very end in the flue box as well as the bottom of the burner area. Use a circular metal brush with a maximum diameter of 40 mm and a flexible rod.
4. Brush all of the inside of the flue box.



5. Clean with pressurised air or nitrogen once brushing is complete. A vacuum cleaner should be used to remove all remains of dirt.
6. Proceed in reverse order to refit the assembly.

ATTENTION

Make sure the flue box seal with the panel is in good condition. Where necessary, replace it with another of the same size and characteristics:

- ***Closed silicone cell with minimum temperature limit of 205 °C.***

2

Options and accessories

An “OPTION” (O) includes those factory-fitted and supplied installed in the unit and ready for use.

An “ACCESSORY” (A) is defined as those that are fully or partially fitted on site.

ATTENTION

The ECONOMISER is considered an “OPTION”, despite the fact that the rain protection must be installed on site for transportation reasons.

Name	Option	Accessory
DPC-1 thermostat		A
Economiser, modulating, temperature control	O	
Enthalpy probes for economiser	O	
Air quality probe (IAQ)	O	
Barometric damper		A
Exhaust fan		A
Fixed outdoor air intake		A
Low temperature control (Low Ambient)	O	
Air filters F6	O	
Air filters F7	O	
Dirty filter pressure switch	O	
Smoke detector	O	
Fire detection thermostat	O	
Hot water coil	O	
Heating element	O	
Outdoor coil protection	O	
Anti-vibration kit		A
Propane conversion kit (ARG/ARD)		A
Copper fin coils	O	
“Blue Fin” coils	O	
Fixed Roofcurb		A
Adjustable Roofcurb		A
Roofcurb adapter from SUNLINE to ACTIVE		A
Energy recovery system		A

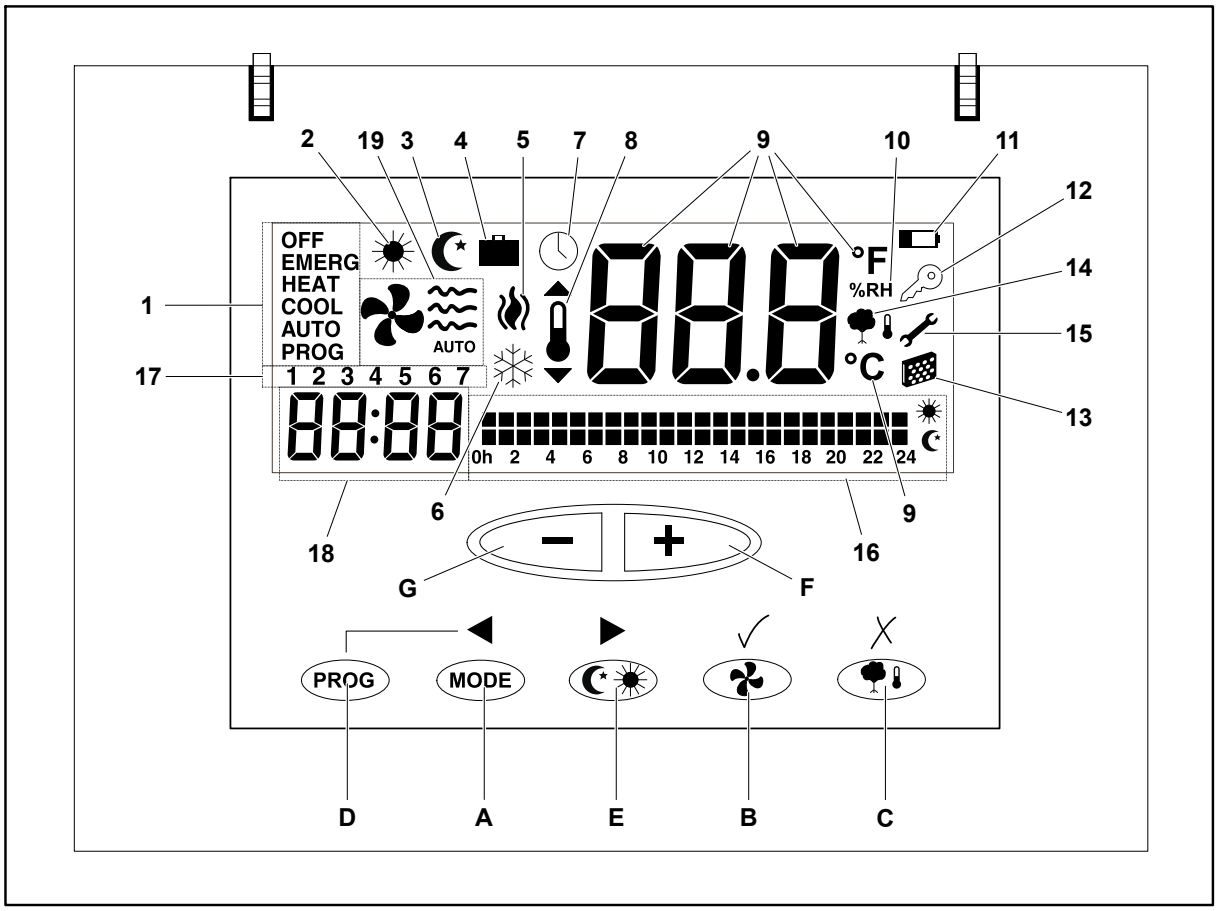
2.1 DPC-1 Programmable digital thermostat with communication

Interior appearance of the thermostat

NOTE

With the lid lifted, showing the central panel

The lid is only lifted to access the controls.



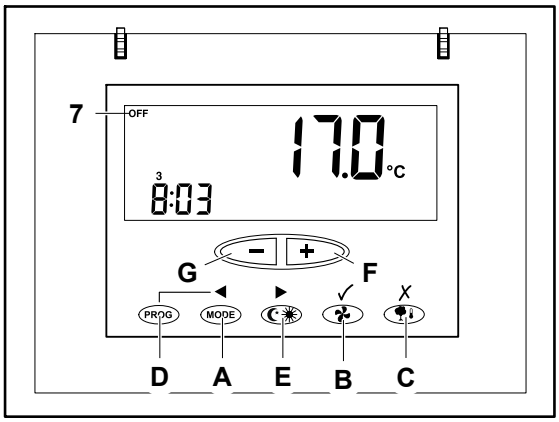
1	HVAC mode	11	Battery flat
2	Comfort (day)	12	Keys blocked
3	Economy (night)	13	Dirty filters
4	Unoccupied	14	Outdoor temperature
5	Heat	15	Warning or incident
6	Cold	16	Time profile
7	Timer activated	17	Day of the week
8	Temperature setting	18	Hour
9	Room temperature	19	Fan
10	Relative humidity		

2.1.1 HVAC modes

The different HVAC modes can be selected by pressing the **MODE** key **-A-** successively.

Off

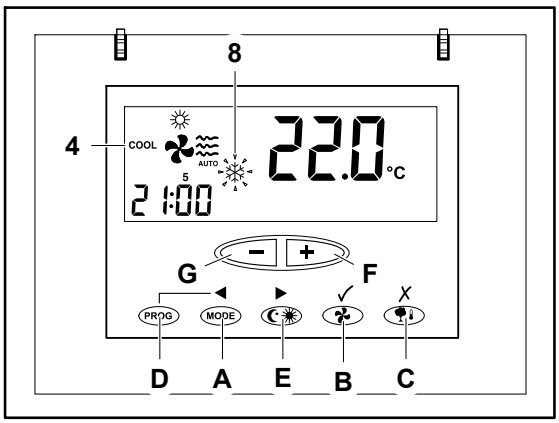
The HVAC system is switched off in this mode. The screen displays **OFF-7-**.



Cold

The screen displays **COOL-4-**.

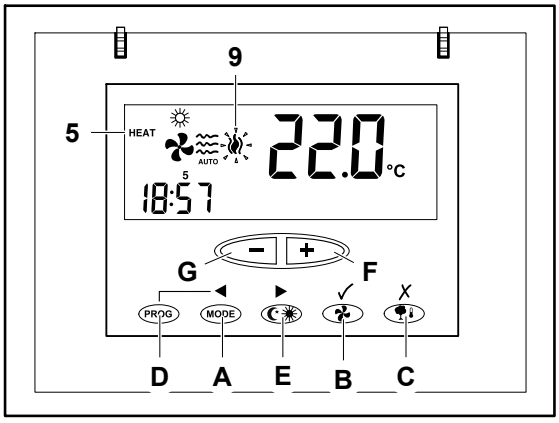
- Icon **-8-** flashes if there is demand.
- Icon **-8-** remains static if not.



Heat

The screen displays **HEAT-5-**.

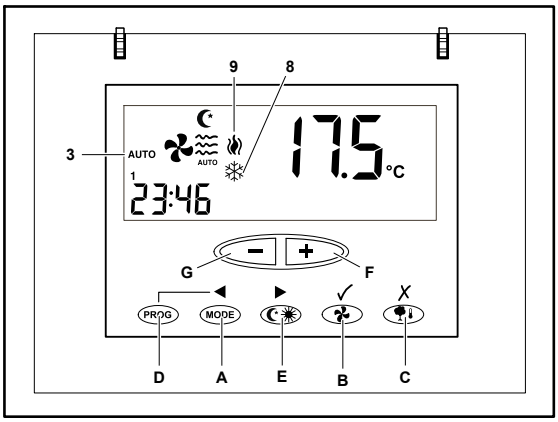
- The sides of icon **-9-** flash if there is demand.
- The sides of icon **-9-** remain static if not.



Auto

The screen displays **AUTO-3-**. The heating and the cooling functions of the system are enabled.

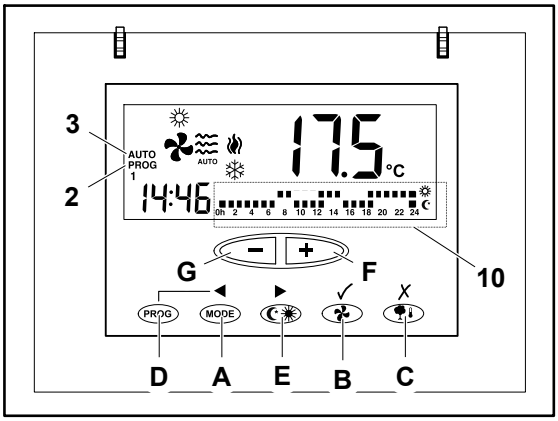
- Icons **-8-** and **-9-** flash if there is demand.
- Icons **-8-** and **-9-** remain static if not.



Programmed

The screen displays **PROG-2-** and **AUTO-3-**. Programmed mode involves the aforementioned **AUTO** mode, but also includes the time profile **-10-**.

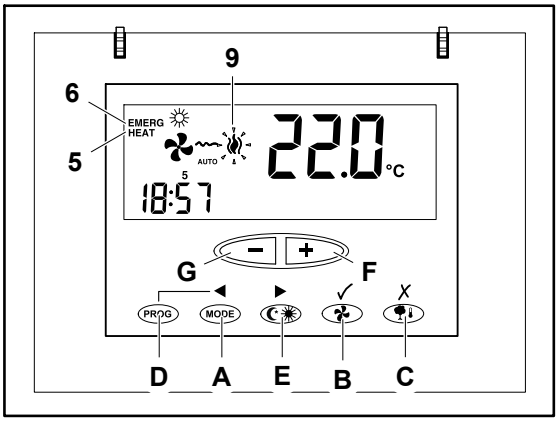
This option is not displayed if micro-switch pin 2 is OFF (see the micro-switch configuration).



Emergency heat

The screen displays **HEAT-5-** and **EMERG-6-**.

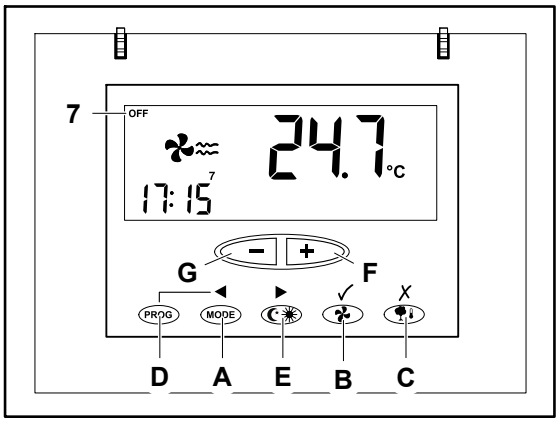
- Icon **-9-** flashes if the unit is running.
- Icon **-9-** remains static without the sides if not.



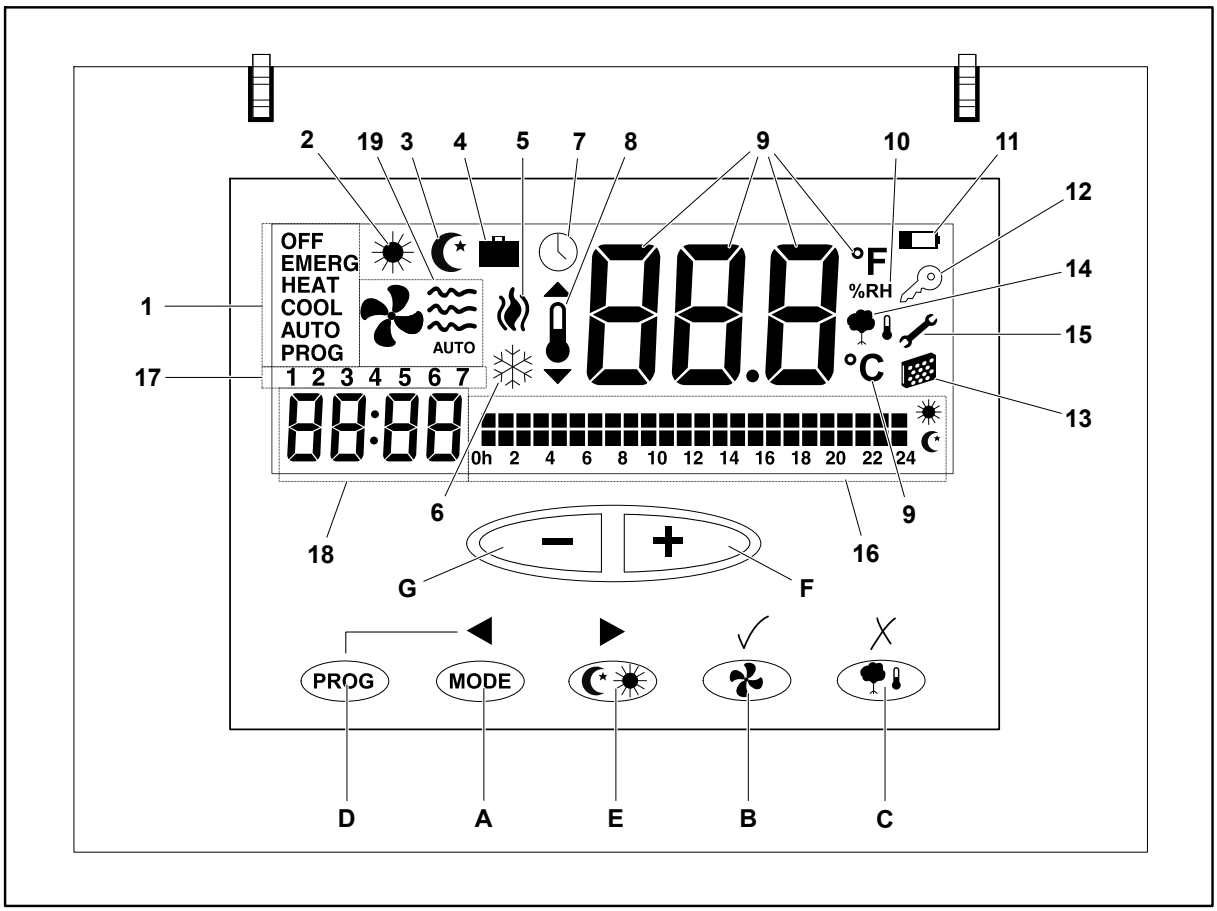
Ventilation only

This is accessed in **OFF-7-** mode and button **-B-** is pressed to select the fan speed.

This means that the HVAC system is stopped and only the fan is running.



2.1.2 Button functions



HVAC mode button -A-

By pressing this button (in *Normal mode*) the current air conditioning mode will be modified (**OFF**, **COOL**, **HEAT**, **AUTO**, **AUTO PROG**, **EMERG HEAT**).

Fan button -B-

By pressing this button it will enter *Adjustment mode*, which lasts for 5 seconds. In this mode, the fan flashes and the configured speed is displayed, together with whether it is in *Auto* or *Fixed* mode.

Outside temperature button -C-

By pressing this button (in *Normal mode*) the outdoor temperature is displayed for 5 seconds.

Programming button -D-

By pressing this button (in *Normal mode*) it will enter *Programming mode*, which enables the selection of one of the following options:

-2-	Programming of the set temperatures for heat and cold in *Occupied*, *Comfort* or *Day* status.
-3-	Programming of the set temperatures for heat and cold in *Standby*, *Economy* or *Night* status.
-4-	Programming of the set temperatures for heat and cold in *Unoccupied* status.
-7-	Setting of the clock (day of the week, hours and minutes).
-16-	Programming of the time profiles. A time profile only permits *Comfort* and *Economy* (Day and Night) status.
-19-	Fan programming.

Occupancy status button -E-

By pressing this button (in *Normal mode*) the current occupancy or comfort (Day / Night) status changes and the set temperature is displayed next to the flashing icon **-8-**. If you press the button again whilst still in *Adjustment mode*, it will switch from one status to another in a sequential and cyclical manner.

If button **-E-** remains pressed down for more than one second, it switches to *Unoccupied mode*. If no other action is taken in this mode, the unoccupied status will remain indefinitely.

If button **-D-** is pressed, the setting disappears and the no. 0 is displayed in its place to indicate the number of days for which the unoccupied status must last. Buttons **-F-** and **-G-** increase or decrease the days during which the status is to be unoccupied (with a maximum of 99 days). Icon **-7-** is displayed.

More -F- and less -G- buttons.

By pressing one of the two buttons (in *Normal mode*) it will switch to *Adjustment mode*, displaying the current temperature setting, which is indicated by the flashing icon **-8-**.

If it remains pressed down for more than one second or it is released and then pressed again whilst still in *Adjustment mode*, the temperature setting will be increased by 0,5 °C or 1 °F.

If the two button are pressed at the same time, it switches from **°C** to **°F** and vice versa.

2.2 Economiser, modulating, temperature control

This consists of one damper located on the unit return and another located on the outdoor air inlet.

The control compares the outdoor air and return air temperature values and sets the opening of both dampers proportionally using the 0 - 10 V modulating actuator with return spring.

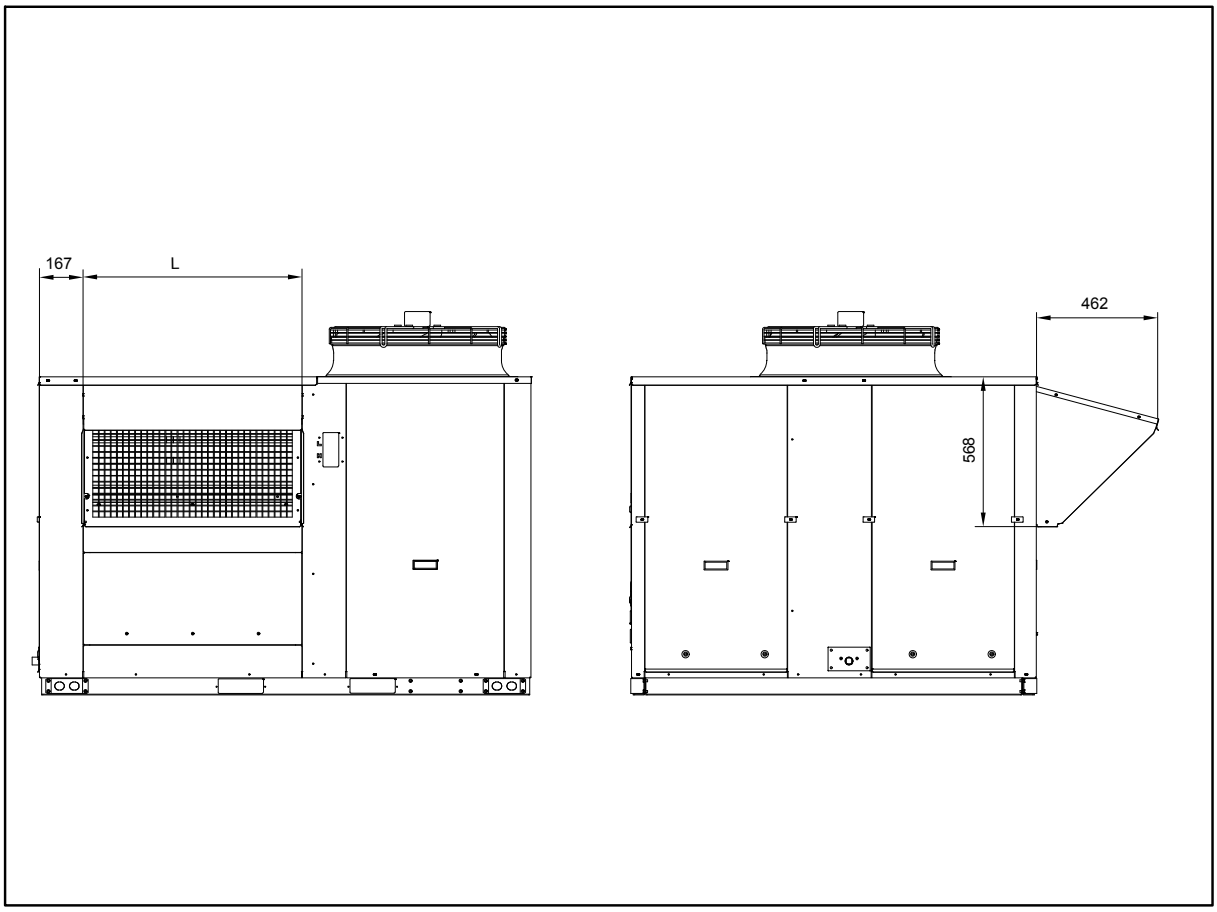
To guarantee a good comfort level, the supply temperature is limited to 12 °C.

The dampers are factory-set for a minimum volume of outdoor air of approximately 10%.

The outdoor air damper has rain protection that is supplies ready for installation on the outdoor air inlet opening on the side of the unit.

Where necessary, enthalpy probe control options can be added to the economiser (see section *Enthalpy probes, see on page 57*) as well as an exhaust system for excess air when the design of the installation requires as such (see sections *Barometric excess pressure damper, see on page 57* and *Exhaust fan, see on page 58*).

The economiser can be adapted to work as a motorised outdoor air damper and the minimum and maximum outdoor air volume values can be set according to installation requirements (bearing in mind the unit operating limits).



Model	L
017 / 022	830
032 / 040	1080

2.3 Enthalpy probes

In areas where the level of humidity is important, where a more precise control of the economiser to suit requirements is needed.

2.4 Indoor air quality probe

This option requires the economiser for it to work properly. The probe measures the degree of pollution due to the level of room occupancy, tobacco, kitchen smoke, carbon monoxide, etc.

When the pre-set limits are exceeded, the control acts on the economiser, adjusting the outdoor air damper regardless of the cooling operation of the unit.

Three air quality levels can be selected on the probe (the default level is *normal*).

2.5 Barometric excess pressure damper

This relieves excess air pressure inside the building that may be generated through use of the economiser or the motorised damper. It is the cheapest and most suitable extraction system for installation where the air return is duct-free and planned air exhaust is a maximum of 25% of the total supply air flow.

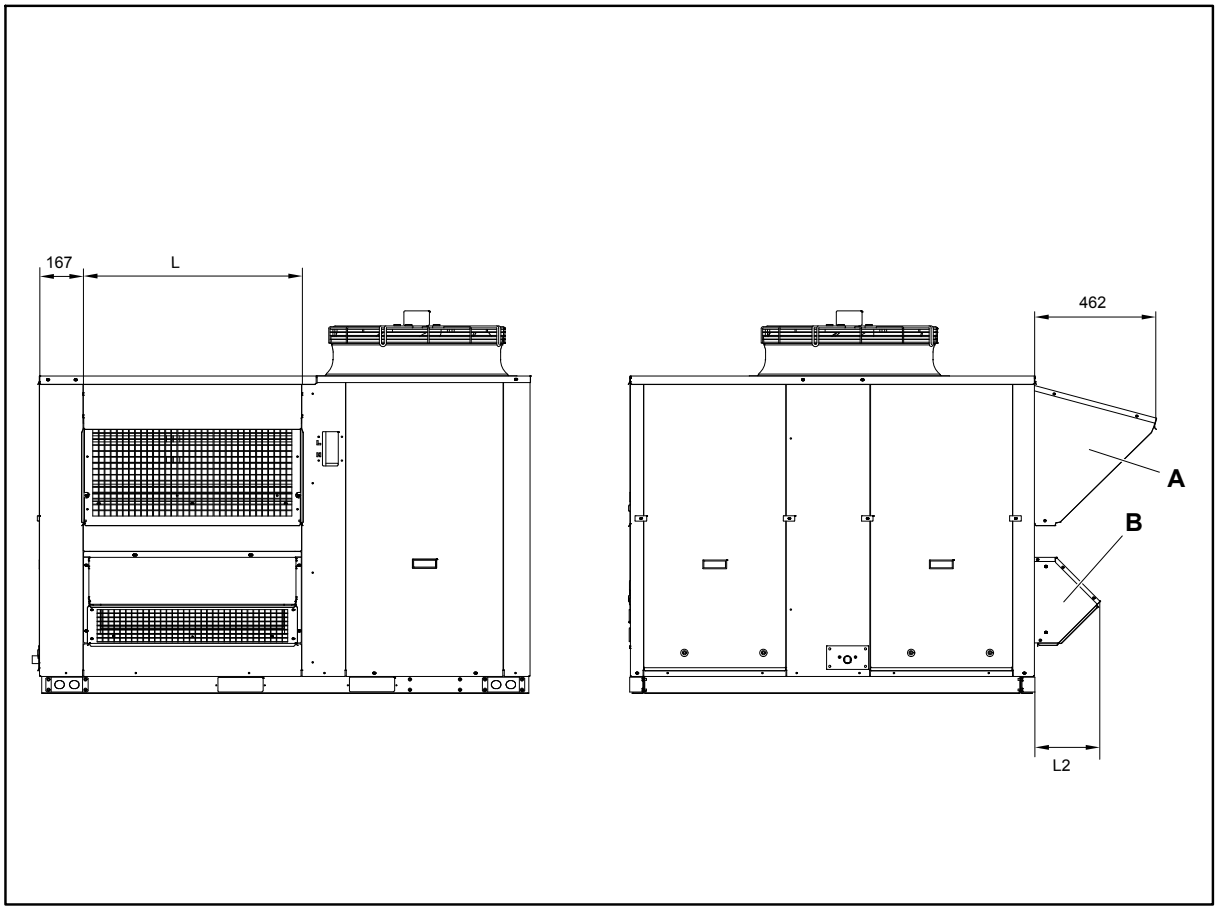
It is formed by an excess pressure damper and rain protection with a built-in bird protection grille.

When it opens, the outdoor air intake increases and the return air flow is closed proportionally, increasing the pressure inside the building. When the pressure is greater than atmospheric pressure, the damper is opened to release any excess pressure directly outdoors.

Where the return duct connection to the unit is at the bottom, the barometric damper assembly and rain protection are installed on the side of the unit.

Where the return duct connection to the unit is on the side, the barometric damper assembly and rain protection are installed as close to the unit as possible, directly on the front of the return duct.

The assembly is supplied prefitted for on-site installation.



A Rainhood Economiser

B Barometric damper

Model	L	L2
017 / 022	830	249
032 / 040	1080	290

2.6 Exhaust fan

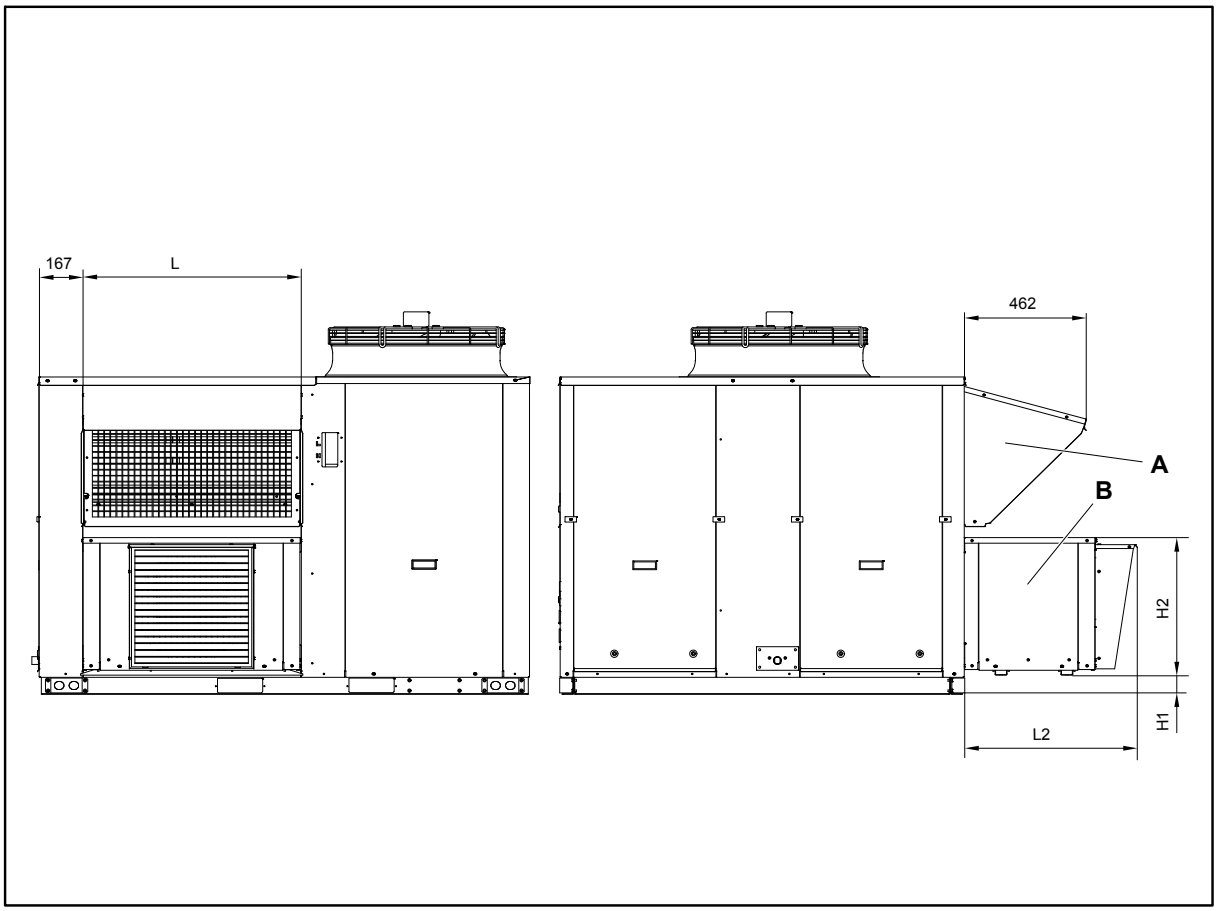
This is the most suitable extraction system for installations using an economiser or motorised damper, where the air return is ducted and planned air exhaust is above 25% of the total supply air flow. The system is formed by a centrifugal motorised fan housed inside a sealed box, an excess pressure damper and rain protection.

Up to approximately 30% of outdoor air inlet opening, operating as a barometric damper. The fan is enabled at this point and the air is discharged directly outdoors.

Where the return duct connection to the unit is at the bottom, the barometric damper assembly and rain protection are installed on the side of the unit.

Where the return duct connection to the unit is on the side, the barometric damper assembly and rain protection are installed as close to the unit as possible, directly on the front of the return duct.

The assembly is supplied prefitted for on-site installation. A cable is supplied for connection of the fan to the electric box.



A Rainhood Economiser

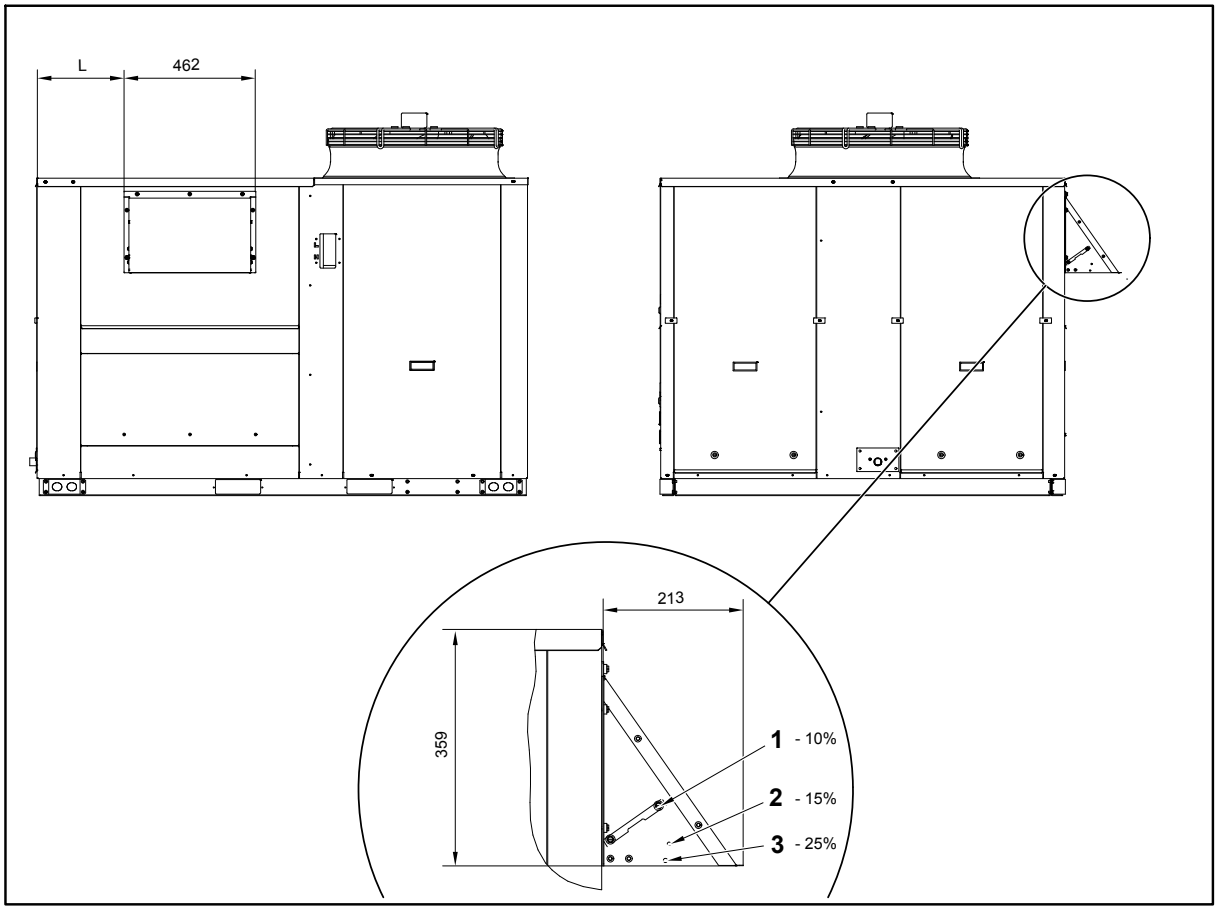
B Exhaust fan

Model	L	L2	H1	H2
017 / 022	830	655	73	655
032 / 040	1080	655	35	723

2.7 Fixed outdoor air intake

This allows for a fixed percentage of outdoor air inlet in units with no economiser or motorised damper. It is formed by a side panel assembly with a covered opening with rain protection. Inside the rain protection is a damper that can be fixed in three positions, obtaining the fixed fresh air inlet percentages to approximately 10%, 15% or 25%, depending on installation requirements.

The assembly is supplied prefitted for on-site installation.



Model	L
017 / 022	350
032 / 040	475

2.8 Low temperature control (low ambient)

Rooftop units are designed to work in cold mode to a minimum outdoor temperature of 7 °C. With this option, they can operate correctly to a minimum outdoor temperature of -18 °C.

2.9 Air filters F6 and F7

These are high-performance air filters (according to Standard EN-779). The unit is fitted with guides for their installation behind the standard filters G4, in line with the requirements of the strictest regulations on indoor air quality in buildings.

They have a galvanised steel frame, minipleat-type filtering and a protection mesh on the air inlet and outlet side.

2.10 Dirty filter pressure switches

These provide a dry contact when the air filters are blocked to indicate that maintenance or replacement is required. The filter icon is indicated on the display connected to the thermostat DPC-1.

2.11 Smoke detector

The detector is fitted in the return air area of the unit. If particles of smoke are detected, the unit stops and switches to "lock out" mode, in which case it must be manually reset before it can be restarted.

ATTENTION

The smoke detector is fitted to protect the unit. It must not be used as a protection system for the building or other facilities. Its use is subject to compliance with local regulations involving unit installation (relating to ventilation systems, fire prevention, etc.).

Depending on the regulations involving the unit, this option may require the use of an economiser or motorised damper.

2.12 Fire detection thermostat

As standard, the unit is fitted with an air supply probe that stops the unit at 80 °C and switches it to "lock out" mode, in which case where the control must be manually reset.

Using this option, a set temperature probe and manual reset are located in the unit supply area. If the selected temperature is reached in this area, the unit stops and switches to "lock out" mode, in which case where the probe and control must be manually reset before it can be restarted.

ATTENTION

The fire detection thermostat is fitted to protect the unit. It must not be used as a protection system for the building or other facilities. Its use is subject to compliance with local regulations involving unit installation (relating to ventilation systems, fire prevention, etc.).

Depending on the regulations involving the unit, this option may require the use of an economiser or motorised damper.

2.13 Hot water coil

Located inside the supply plenum of the unit.

This includes all of the hydraulic and control components required for operating, such as the 0-10 V proportional actuator mixer valve and the antifreeze probe. See heat capacities and data in section *Hot water coil, optional in ARC/ARH, see on page 12*.

2.14 Heating element

Available for ARC cold-only models and the ARH heat pump at powers of 16, 25 and 37 kW.

Supplied assembled inside the supply plenum of the unit.

The power supply to the heating resistor must be independent to the general power supply to the unit and must be fitted with its own circuit breaker (not supplied). See sections *ARC units with auxiliary heating element, see on page 10* and *ARH units with auxiliary heating element, see on page 10*.

2.15 Outdoor coil protection

50 x 50 electro-welded rod mesh painted the same colour as the unit panels. Easy to remove and fit using for maintenance purposes.

2.16 Anti-vibration kit

This is formed by the shock absorbers and the necessary nuts and bolts for on-site assembly when fitting the unit. See section *Installation on shock absorbers, see on page 35*.

2.17 Propane conversion kit (for ARG/ARD models)

ATTENTION

The propane gas operating pressure must be 37 mbar.

The injectors for the burners and instructions for correct gas valve adjustment required to convert the burner assembly from natural gas to propane gas are supplied.

2.18 Copper fin coils

Copper fin coils to give the best corrosion protection for installations in coastal areas, maintaining full efficiency. This is applied to the condensers (outdoor units) and evaporators (indoor units). See section *Weight options and accessories, see on page 9* for the increase in weight in relation to standard.

2.19 “Blue Fin” coils

Aluminium fins with a varnish-type polyurethane-based coating to give corrosion protection of up to 100 H.N.S. (ASTM-B117).

2.20 Roofcurb mounting base, fixed type

For installation on flat and levelled building roofs.

Structure made of galvanised sheet steel supplied in kit form for on-site assembly and installation.

Allows for installation of the ducts directly from inside the building following fitting of the rooftop unit and provides a seal connection between it and the building roof.

The roofcurb assembly consists of a closed frame that fits below the base of the unit to provide a sealed connection.

The roofcurb must be attached to the supporting structure of the building roof. To do so, use the nuts and bolts supplied or use welding.

To prevent humidity or condensation from filtering into the building, all of the outer perimeter must be insulated and sealed with an extension of the same material used for the roofing finish.

Model	A	B	C	D	E	F	G	H
017 / 022	1410	450	505	255	1320	235	675	410
032 / 040	1720	600	595	325	1570	260	850	460

2.21 Roofcurb mounting base, adjustable type

For installing on sloping building roofs at gradients of up to 7° (12%) or 6° (10%), depending on the position of the unit.

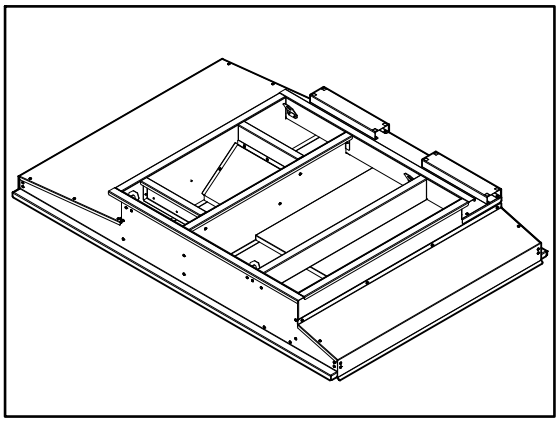
With similar characteristics as the fixed type, but with the advantage of being able to adjust the level of the support surface for the unit to overcome the gradient of the roof.

Model	A	B	C	D	E	F	G	H
017 / 022	1410	450	505	255	1320	235	675	410
032 / 040	1720	600	595	325	1570	260	850	410

2.22 Roofcurb adapter from Sunline to Active

This allows for the Roofcurb existing in old RooftopSunline 090, 120 and 150 installations to be adapted for replacement with the new ACTIVE Rooftop.

It is supplied fully assembled with all insulated panels inside, ready for fitting on the old Roofcurb.



2.23 Energy recovery system

Connected directly to the side of the unit. It is used in combination with the economiser and indoor air quality probe options.

It is formed by a rotary recovery system with a high-performance enthalpy wheel, an outdoor air inlet fan and an exhaust fan and standard air filter G4 and optional filters F6 and F7.

It is ideal for areas with high or low temperatures and areas with a high level of humidity. Also for areas with a very low level of humidity provided by other means (in buildings with a humidifying system), as the humidity is recovered from the exhaust air and re-introduced into the building.

3

Unit installation data

3.1 List of tests for unit start-up

Please complete the following forms to register the full details of the installation and the start-up inspection.

Complete the blank fields or mark the appropriate box, as applicable.

Company performing installation:	
Installing technician:	
Name / project number:	
Location of the unit:	
Address of the unit location:	
Person in charge of the building or property where the unit is installed:	
Installation work start date:	
Unit model number:	
Unit serial number:	
Plate and version:	
Thermostat, model and version:	

General inspection of the unit	
	Visual appearance
	Levelling of the unit
	Check the unit for transport, loading and unloading damage
	Unit installed with sufficient clearance
	Check the circuit for the presence of oil (large coolant leaks).
	Terminals and connections correctly secured in the control panel and accessories
	Air filters installed
	Condensate drain pipe and drain trap installed correctly
	Thermostat and connection cabling installed correctly
	Air duct installation complete and correct
	Accessories and planned options installed (if applicable)

Inspection of the air supply fan	
	Verification of direction of rotation

Inspection of the gas heating section (models ARG/ARD)	
	Verification of the kind of gas supplied to the unit
	Combustion air inlet free of obstacles
	Exhaust outlet free of obstacles

Inspection of compressors	
	Verification that direction of rotation is correct

3.2 Start-up data

Electrical data

	Rating plate	Actual
Power supply	Check specifications in the Installation Manual	
Control voltage		
Fan consumption (A)		
Consumption of condenser fan 1 (A)		
Consumption of condenser fan 2 (A)		
Consumption of compressor 1 (A)		
Consumption of compressor 2 (A)		
Consumption of supply fan (A)		
Heating element 1 (Optional)		
Heating element 2 (Optional)		

Cool and heat modes

Cooling circuit			
Mode		Value	
Subcooling (min. 8 K, max. 18 K)		°C	Liquid pressure: _____ bar
			Liquid temperature: _____ °C
Superheat (min. 4 K, max. 10 K)		°C	Suction pressure: _____ bar
			Suction temperature: _____ °C
	Complete liquid line checked in sight glass		
	Correct oil level checked in sight glass		

Supply air flow rate values

	m^3/h
Design	
Measured	

Air temperature

Mode (cool or heat):	Temperature (°C)
Outdoor air:	
Supply air:	
Return air:	
Indoor air mix (if economiser is fitted):	

OPTIONS

Heating mode (hot water coil)

Air temperature	
Capacity: _____ (kW)	Temperature (°C)
Supply air (at 100 %)	
Return air	

Hydraulic circuit		
	Temperature (°C)	Pressure (bar)
Water inlet		
Water outlet		

Heating mode (gas burner) (ARG/ARD models)

Air temperature	
Capacity: _____ (kW)	Temperature (°C)
Supply air (at 100 %)	
Return air	

Gas circuit (Natural gas)			
Gas family		G20	Pressure (mbar)
Supply line		Min 12,5 / Max 25 mbar	
Gas valve adjustments	Main regulator (PBr)		
	Stage regulator (V_{max})		
Gas consumption m_3/h			

Propane gas conversion, G31, if applicable	
Supply line 37 mbar	Pressure mbar

Gas valve adjustments	Main regulator	
	Stage regulator	
	Gas consumption m_3/h	

Combustion analyser	
Outdoor ambient temperature	___ °C
Smoke temperature	___ °C
Carbon monoxide CO content	____ ppm or ___ %
Carbon dioxide content CO_2	___ %
Nitrogen oxide content NO	____ ppm

Others

Outdoor fan 1	Type or model	
		Surge protection adjusted

Outdoor fan 2	Type or model	
		Surge protection adjusted

Indoor fan	Type or model	
		Surge protection adjusted

Notes and observations:

Installed by:	Name Date and signature

4

Wiring diagrams

4.1 Micro switch configuration

The micro switches are used to establish the following configurations:

ATTENTION

In order to update the new configuration of the micro switches the power supply has to be shut off

MICRO SWITCH CONFIGURATION

Number	Status	Description
1 / 2	OFF/OFF	Defrosting time 0'
	ON/OFF	Defrosting time 30'
	OFF/ON	Defrosting time 60'
	ON/ON	Defrosting time 90'
3	ON	Crossed coils
	OFF	Independent coils
4	ON	Selection of 2 compressors (tandem) - 1 circuit
	OFF	Selection of 1 compressor - 1 circuit
5	ON	Cold selection
	OFF	Heat pump selection
6	ON	4-way valve active in heat
	OFF	4-way valve active in cold
7	ON	Receives signal **B** from thermostat (active in heat)
	OFF	Receives signal **O** from thermostat (active in cold)
8	ON	Fan enabled during defrost
	OFF	Fan disabled during defrost

4.2 Fault table

The red LED on the YKNOpen electronic board is responsible for showing the state of faults on the unit:

- When the red LED remains off there are no faults in the unit.
- If the red LED does two series of flashes in a constant sequence, there is a fault which must be checked in the following table:

FAULT TABLE (RED LED)

Red LED flashes		Description
1st Series	2nd Series	
1, 2 or 3	1	Discharge temperature exceeded
	2	High-pressure switch, outdoor fan thermal switch or compressor module thermal switch
	3	Low pressure switch
	4	Indoor fan thermal switch
	5	Repeated cold start-up or suction temperature < -25 °C
4	1	Gas control 1 or heating element 1 fault
	2	Gas control 2 or heating element 2 fault
	3	Heating element 3 stage fault
	4	Heating element 4 stage fault
	5	Fault in economiser or hot water coil (outdoor supply probe, water return)
	6	Smoke or high temperature detection (accessory) or supply temperature > 80 °C

4.3 Incidents

The green LED on the YKNOpen electronic board is responsible for showing the state of incidents on the unit:

- If the green LED flashes in a constant sequence, there are no incidents in the unit.
- If the green LED does three series of flashes in a constant sequence, there is an incident which must be checked in the following table:

NOTE

The first series indicates the affected circuit: one flash for the first compressor, two for the second, three for the third and four for miscellaneous incidents. A short pause follows. The second and third series specify the direct cause of the incident.

INCIDENT TABLE (GREEN LED)

Green Led flashes			Description	
1st Series	2nd Series	3rd Series	Type	Incident
1, 2 or 3	1	1	Probes	Discharge probe open or short circuited
		2		Liquid probe open or short circuited
		3		Suction probe open or short circuited
	2	1	Temperature	Repeated defrosting
		2		The discharge temperature is not recovered
4	1	1	Probes	Supply probe open or short circuited
		2		Return probe open or short circuited
		3		Outdoor probe open or short circuited
		4		Water probe open or short circuited
		5		Fault in the enthalpy probes
	2	1	Thermostat	Signal **Y1** or **Y2** without signal **G**
		2		Signal **W** without signal **B**
		3		Signal **W** without signal **G**
		4		Signal **Y2** without signal **Y1**
	3	1	Auxiliary heat	Heating element thermal switch 1
		2		Heating element thermal switch 2
		3		Heating element thermal switch 3
		4		Heating element thermal switch 4
	4	1	Temperature	The water coil temperature is not recovered
		2		Outdoor temperature too low
		3		Water coil performing antifreeze operation
		4		Supply temperature above 55 °C
		5		Supply temperature < 25 °C with gas
	5	1	Others	Transceiver ID unknown
		2		There is at least one accessory not found
		3		Air quality demand
		4		Dirty filters
		5		Presence sensor is unoccupied
		6		Suction temperature < 0 °C, economiser

4.3.1 Test button

- If the test button is pressed until the green led is activated, certain times are shortened.
- If the test button is pressed until the orange led is activated, any fault that has been detected is reset.
- If the test button is pressed until the red led is activated, the optional accessories and probes connected to the board are identified.

4.4 DPC-1 thermostat

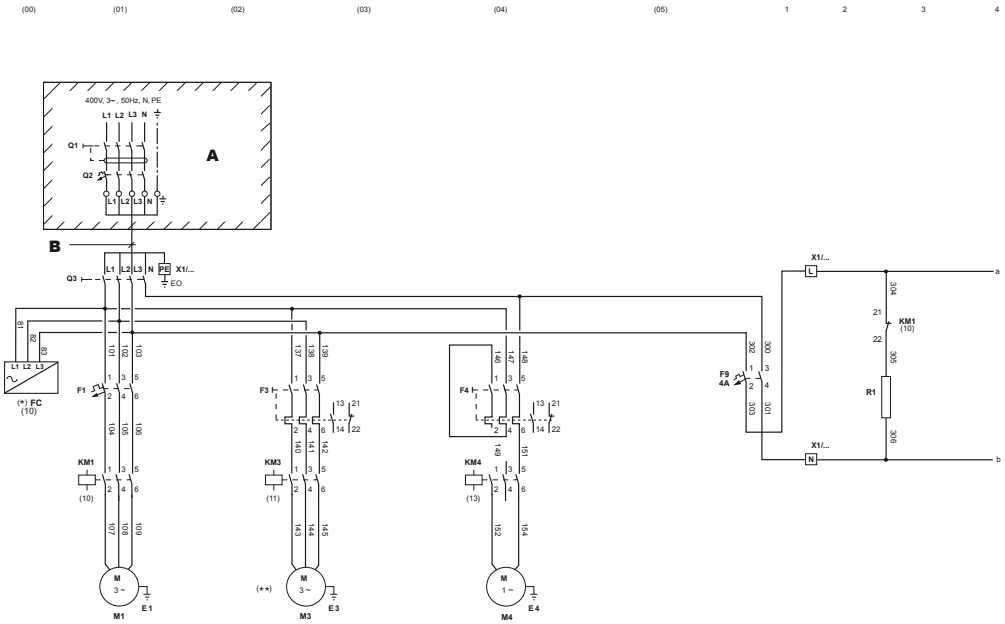
When a fault occurs and there is communication between the unit and the thermostat, the thermostat alternately displays the time and the fault produced according to the unit fault table.

It also displays other faults related to the thermostat.

MICRO SWITCH CONFIGURATION

Type	Thermostat numbers		Description
Thermostat	9	1	Ambient probe open or short circuited
	9	2	Internal probe not calibrated
	9	3	Communication error
	9	4	Fault with **AL** terminal connected
	9	5	S5 digital probe not detected
	9	6	S6 digital probe not detected
	9	7	S7 digital probe not detected
	9	8	S8 digital probe not detected
	9	9	Digital outdoor probe not detected

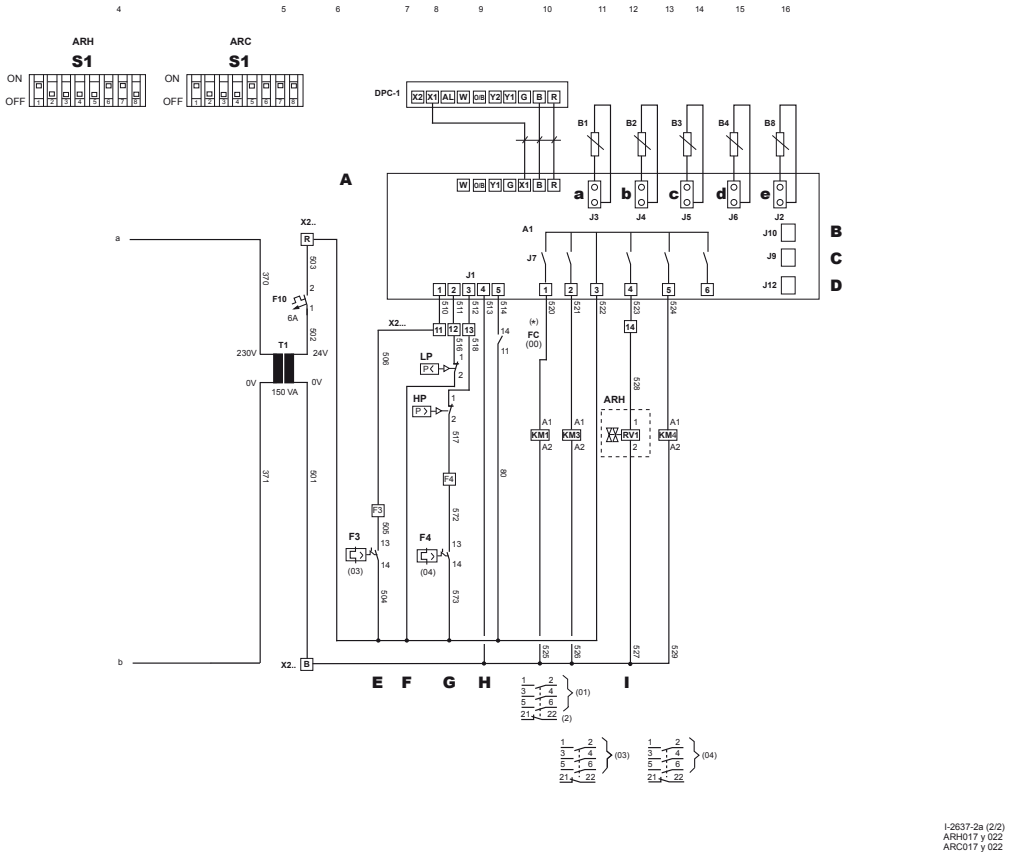
4.5 ARC/ARH 017/022 wiring diagrams



Model	Q2 [A]	B	F1 [A]	F3 [A] REG.	F4 [A] REG.
017	20	5 x 4	16	2	3
022	25	5 x 6	16	3	3

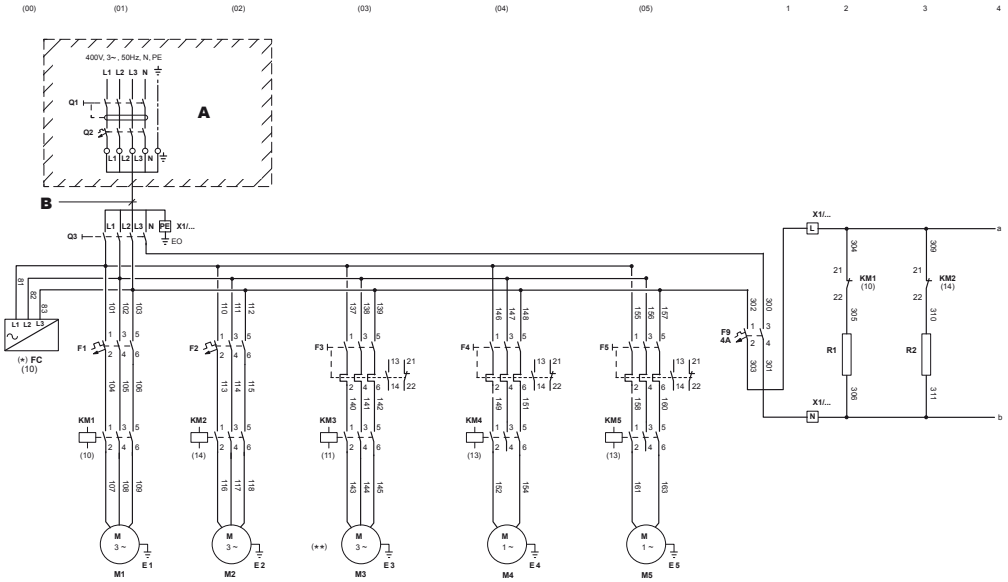
(*) If the unit has power and the green LED **V2** on board **A1** is off, check that the sequence of phases **L1**, **L2**, **L3** is correct

A	On-site installation. These components are not supplied by the manufacturer	M3	Supply fan
B	Cross-section B [mm^2]	M4	Outdoor fan 1
FC	Phase control	R1	Crankcase heater 1
M1	Compressor 1		



A	Shielded cable, 10 x 0,22 mm^2	B2	Liquid probe
B	Accessories connection [J10]	B3	Discharge probe
C	YKTOOL connection [J9]	B4	Outdoor probe
D	RS-485 connection [J12]	B8	Supply probe
E	Indoor fan motor trip switch	DPC-1	Thermostat
F	High and low pressure switch 1	S1	**S1** configuration on A1 board
G	Outdoor fan motor trip switch 1	a	Black connector [J3]
H	Phase control	b	Green connector [J4]
I	4-way valve 1	c	White connector [J5]
A1	Electronic board	d	Yellow connector [J6]
B1	Suction probe	e	Red connector [J2]

4.6 ARC/ARH 032/040 wiring diagrams

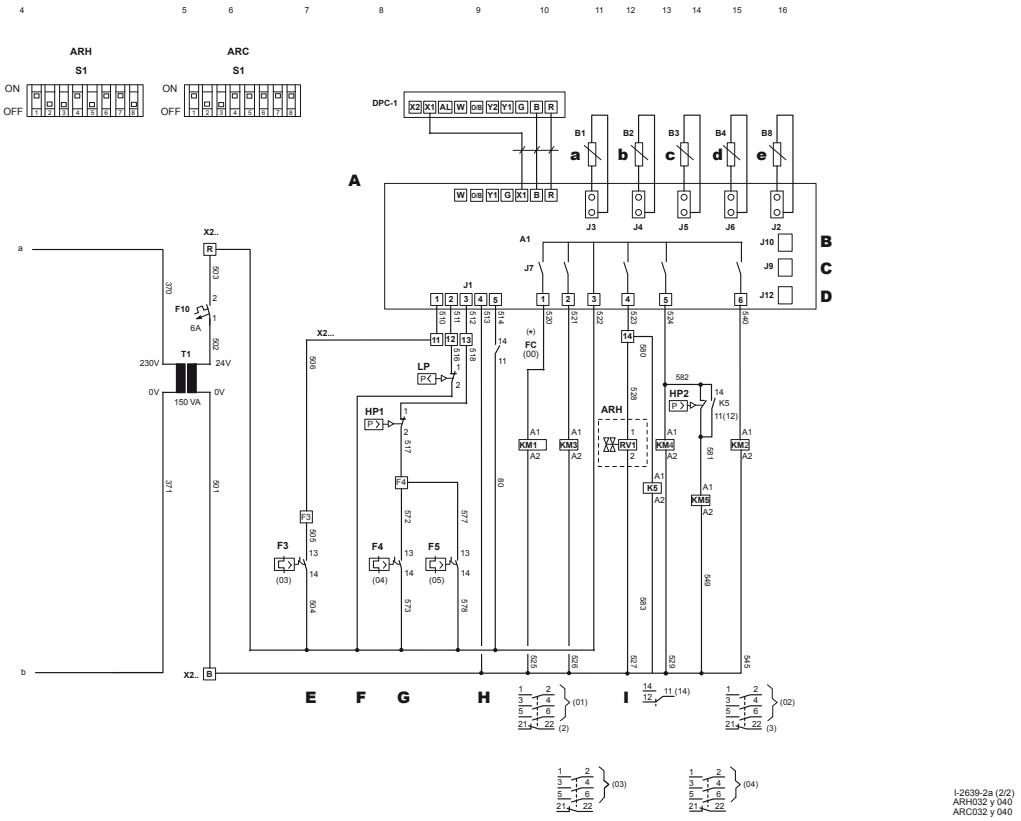


I-2639-1a (1/2)
ARH032 y 040
ARC032 y 040

(*) If the unit has power and the green LED **V2** on board **A1** is off, check that the sequence of phases **L1**, **L2**, **L3** is correct

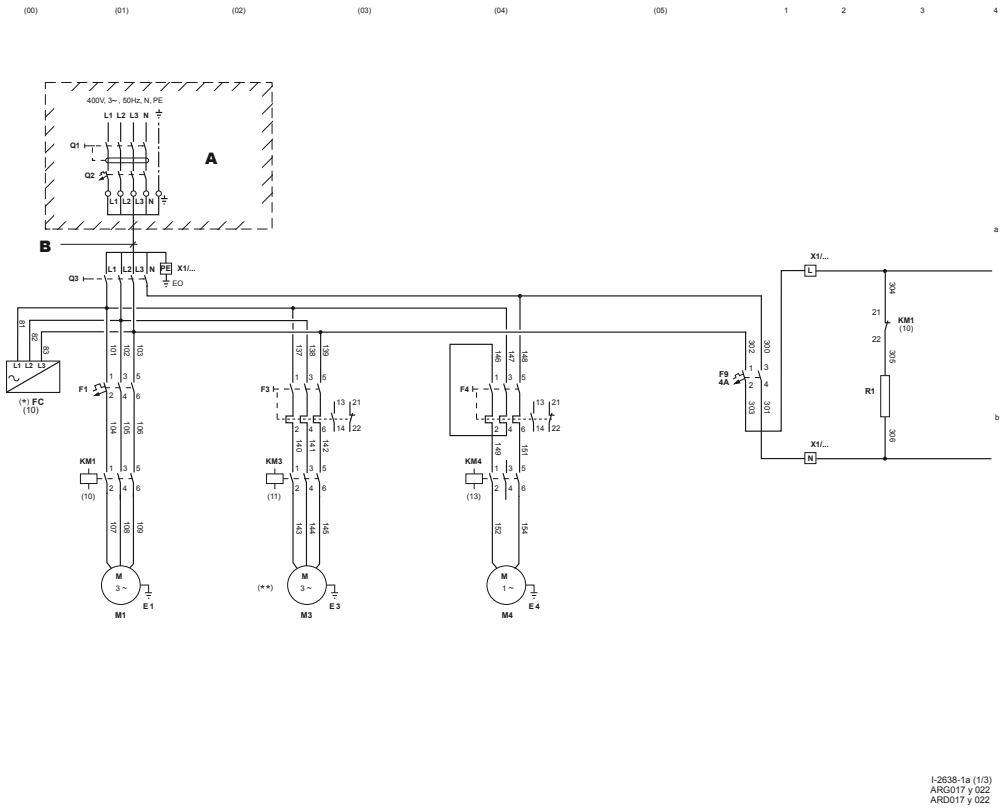
Model	Q2 [A]	B	F1 [A]	F2 [A]	F3 [A] REG.	F4 [A] REG.	F5 [A] REG.
032	40	5 x 10	16	16	5	3	3
040	50	5 x 16	16	16	5	3	3

A	On-site installation. These components are not supplied by the manufacturer	M3	Supply fan
B	Cross-section B [mm^2]	M4	Outdoor fan 1
FC	Phase control	M5	Outdoor fan 2
M1	Compressor 1	R1	Crankcase heater 1
M2	Compressor 2	R2	Crankcase heater 2



A	Shielded cable, 10 x 0,22 mm^2	B8	Supply probe
B	Accessories connection [J10]	B1	Suction probe
C	YKTOOL connection [J9]	B2	Liquid probe
D	RS-485 connection [J12]	B3	Discharge probe
E	Indoor fan motor trip switch	DPC-1	Thermostat
F	High and low pressure switch 1	S1	**S1** configuration on A1 board
G	Outdoor fan 1 and 2 motor trip switch	a	Black connector [J3]
H	Phase control	b	Green connector [J4]
I	4-way valve 1	c	White connector [J5]
A1	Electronic board	d	Yellow connector [J6]
B4	Outdoor probe	e	Red connector [J2]

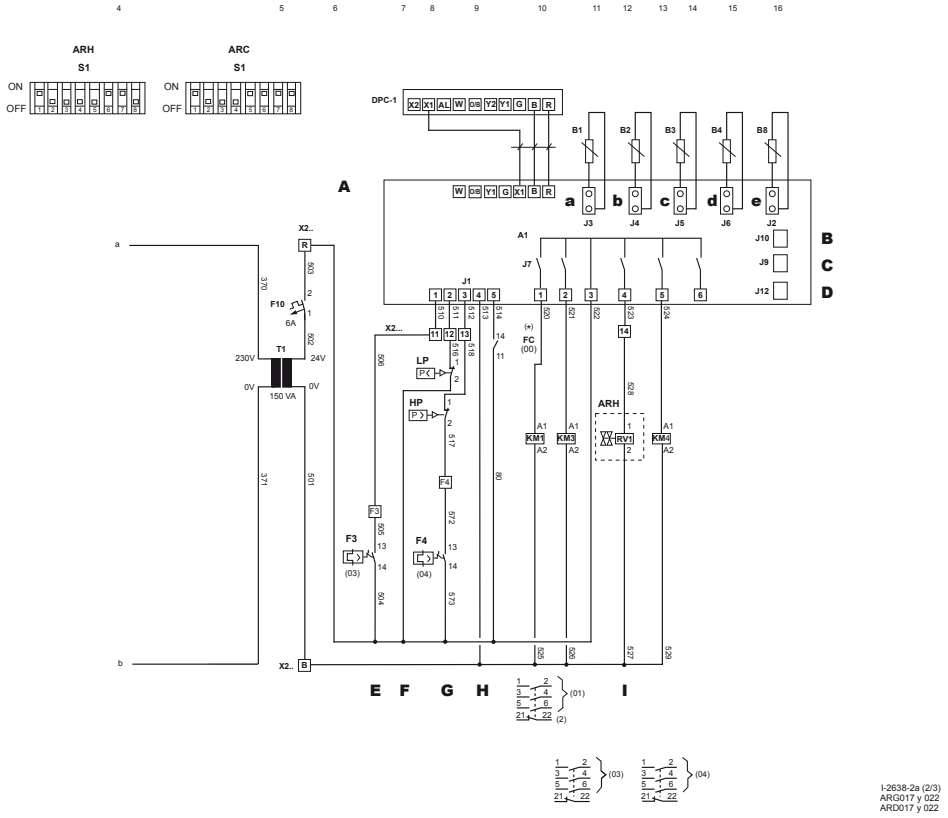
4.7 ARG/ARD 017/022 wiring diagrams



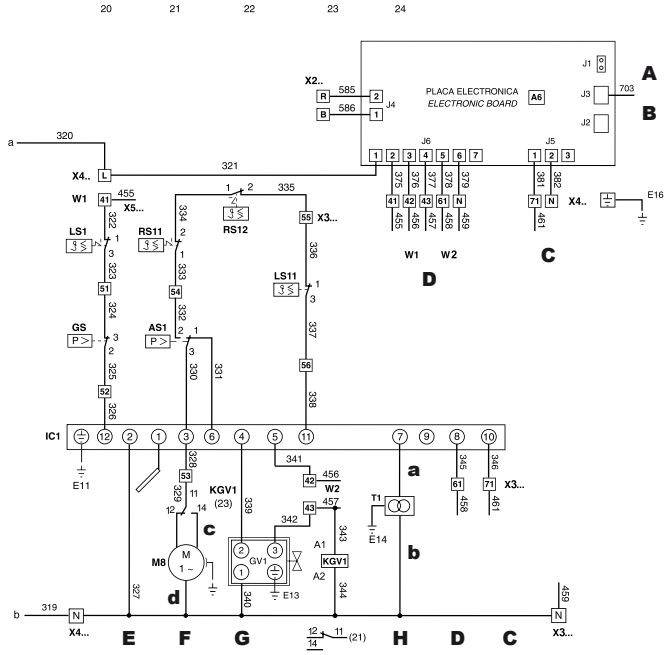
Model	Q2 [A]	B	F1 [A]	F3 [A] REG.	F4 [A] REG.
017	20	5 x 4	16	2	3
022	25	5 x 6	16	3	3

(*) If the unit has power and the green LED **V2** on board **A1** is off, check that the sequence of phases **L1**, **L2**, **L3** is correct

A	On-site installation. These components are not supplied by the manufacturer	M3	Supply fan
B	Cross-section B [mm^2]	M4	Outdoor fan 1
FC	Phase control	R1	Crankcase heater 1
M1	Compressor 1		

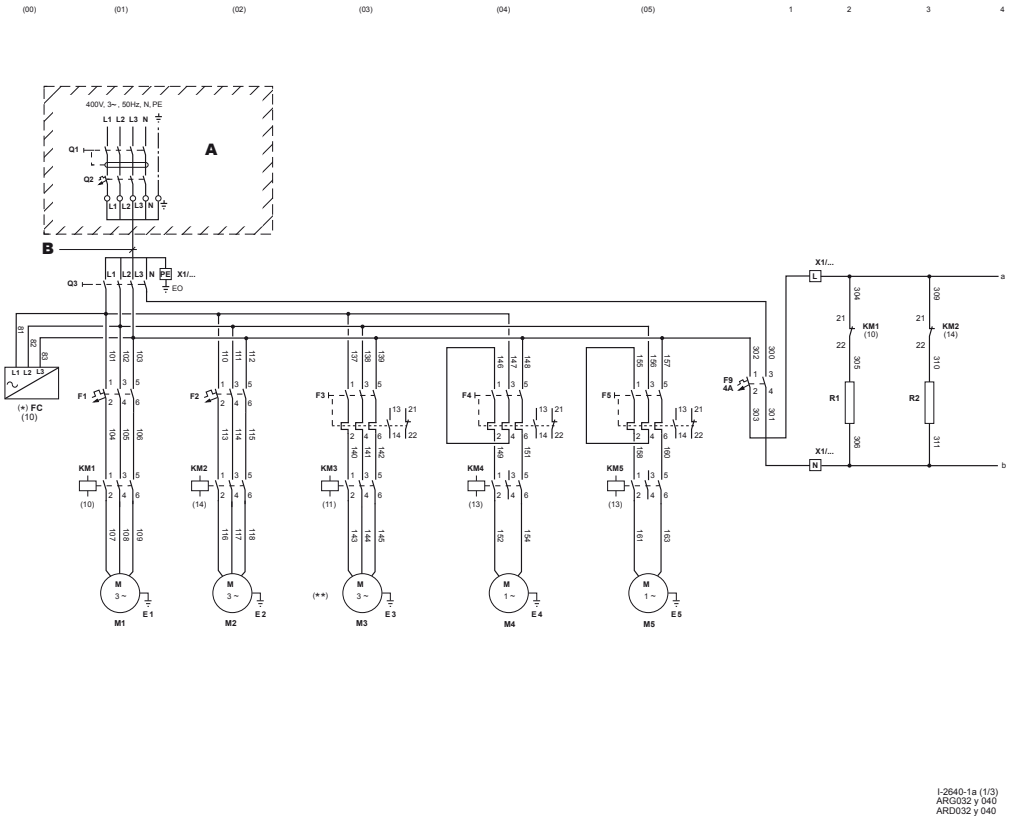


A	Shielded cable, 10 x 0,22 mm^2	B2	Liquid probe
B	Accessories connection [J10]	B3	Discharge probe
C	YKTOOL connection [J9]	B4	Outdoor probe
D	RS-485 connection [J12]	B8	Supply probe
E	Indoor fan motor trip switch	DPC-1	Thermostat
F	High and low pressure switch 1	S1	**S1** configuration on A1 board
G	Outdoor fan motor trip switch 1	a	Black connector [J3]
H	Phase control	b	Green connector [J4]
I	4-way valve 1	c	White connector [J5]
A1	Electronic board	d	Yellow connector [J6]
B1	Suction probe	e	Red connector [J2]



A	NO Bridge on J1	A6	Electronic board
B	Accessories connection [J2]	W1	Gas stage 1
C	Gas alarm 1	W2	Gas stage 2
D	Reset gas 1	a	Brown cable
E	Flame sensor 1	b	Blue cable
F	Smoke outlet motor	c	Black wire
G	Gas valve 1	d	White wire
H	Ignition transformer 1 (T1)	e	Red cable

4.8 ARG/ARD 032/040 wiring diagrams

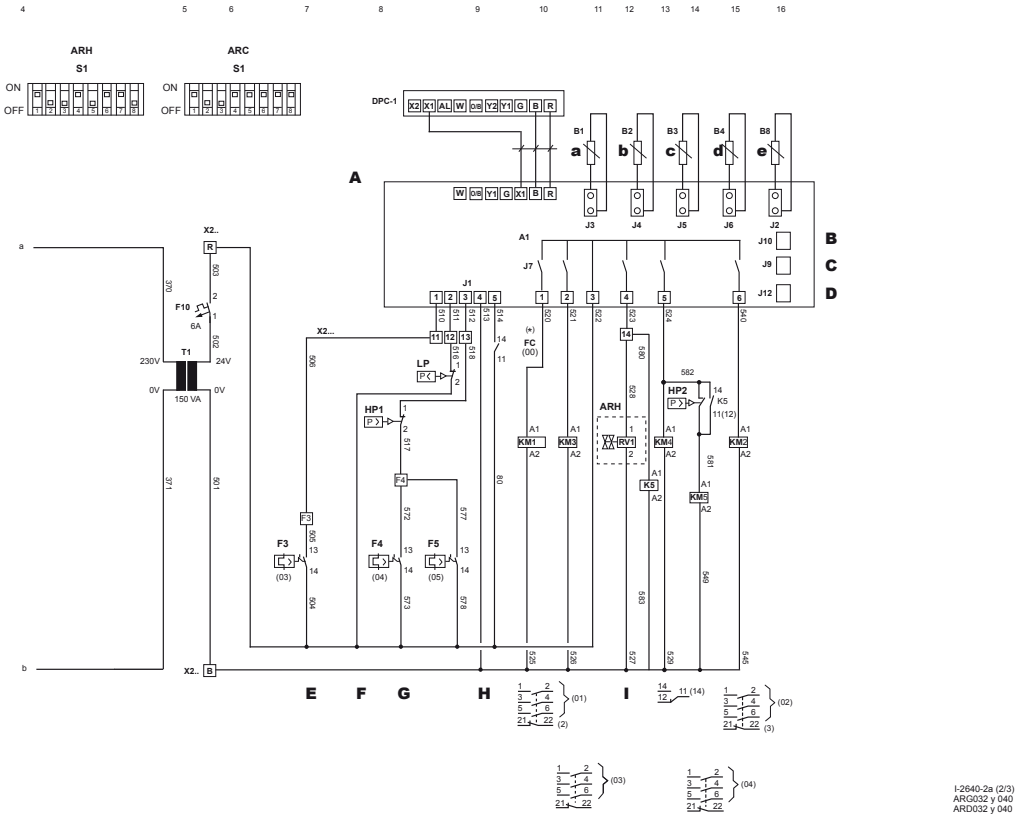


I-2640-1a (1/3)
ARG032 y 040
ARD032 y 040

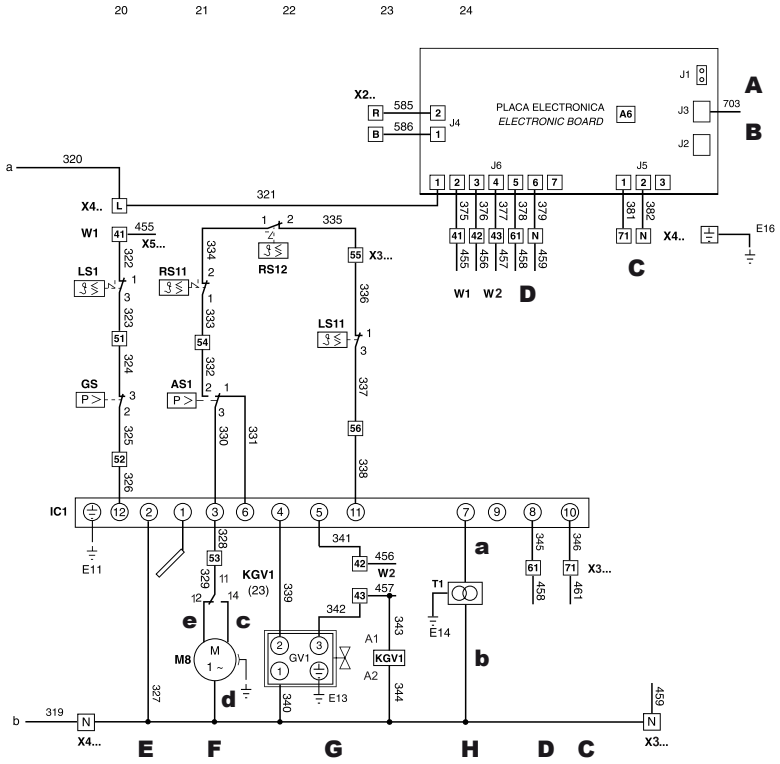
Model	Q2 [A]	B	F1 [A]	F2 [A]	F3 [A] REG.	F4 [A] REG.	F5 [A] REG.
032	40	5 x 10	16	16	5	3	3
040	50	5 x 16	16	16	5	3	3

(*) If the unit has power and the green LED **V2** on board **A1** is off, check that the sequence of phases **L1**, **L2**, **L3** is correct

A	On-site installation. These components are not supplied by the manufacturer	M3	Supply fan
B	Cross-section B [mm^2]	M4	Outdoor fan 1
FC	Phase control	M5	Outdoor fan 2
M1	Compressor 1	R1	Crankcase heater 1
M2	Compressor 2	R2	Crankcase heater 2



A	Shielded cable, 10 x 0,22 mm^2	B8	Supply probe
B	Accessories connection [J10]	B1	Suction probe
C	YKTOOL connection [J9]	B2	Liquid probe
D	RS-485 connection [J12]	B3	Discharge probe
E	Indoor fan motor trip switch	DPC-1	Thermostat
F	High and low pressure switch 1	S1	**S1** configuration on A1 board
G	Outdoor fan 1 and 2 motor trip switch	a	Black connector [J3]
H	Phase control	b	Green connector [J4]
I	4-way valve 1	c	White connector [J5]
A1	Electronic board	d	Yellow connector [J6]
B4	Outdoor probe	e	Red connector [J2]



A	NO Bridge on J1	A6	Electronic board
B	Accessories connection [J2]	W1	Gas stage 1
C	Gas alarm 1	W2	Gas stage 2
D	Reset gas 1	a	Brown cable
E	Flame sensor 1	b	Blue cable
F	Smoke outlet motor	c	Black wire
G	Gas valve 1 and 2	d	White wire
H	Ignition transformer 1 (T1)		